STATE OF MISSOURI

DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 122005-005 **Project Number:** 2004-12-050

Owner: Buzzi Unicem USA, Inc.

Owner's Address: 100 Broadhead Road, Suite 230, Bethlehem, PA 18017

Installation Name: River Cement Company, dba Buzzi Unicem USA – Selma Plant

Installation Address: 1000 River Cement Road, P.O. Box 1003, Festus, MO 63028

Location Information: Jefferson County, S40N, T23, R6E

Application for Authority to Construct was made for:
Replacement of two (2) existing long-dry clinker production systems and their attending raw mill systems, with a single new clinker production line that will operate with an in-line raw mill and preheater/precalciner kiln system, in addition to adding finish grinding capacity. This review was conducted in accordance with Section (8), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required.*

☐ Standard Conditions (on reverse) are applicable to this permit.

☑ Standard Conditions (on reverse) and Special Conditions (listed as attachments starting on page 3) are applicable to this permit.

DEC - 9 2005

EFFECTIVE DATE

DIRECTOR OR DESGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within eighteen months from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within eighteen months after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devises shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant sources(s). The information must be made available not more than 60 days but at least 30 days in advance of this date. Also, you must the Department of Natural Resources Regional office responsible for the area within which you are located with 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC) as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review, your application and associated correspondence constitutes your permit to construct. The permit allows you to construct <u>and</u> operate your air contaminant sources(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Air Pollution Control Program, P.O. Box 176, Jefferson City, Missouri 65102-0176, attention: Construction Permit Unit.

2004-12-050

Buzzi Unicem USA, Inc.

100 Brodhead Road, Suite 230, Bethlehem, PA 18017

River Cement Company, dba Buzzi Unicem USA – Selma Plant

1000 River Cement Road, P.O. Box 1003, Festus, MO 63028

Jefferson County, S40N, T23, R6E

Replacement of two (2) existing long-dry clinker production systems and their attending raw mill systems, with a single new clinker production line that will operate with an in-line raw mill and preheater/precalciner kiln system, in addition to adding finish grinding capacity. This review was conducted in accordance with Section (8), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority." In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence.

River Cement Company, dba Buzzi Unicem USA – Selma Plant
Jefferson County, S40N, T23, R6E

1. Shut Down of Existing Emission Units and Operations at Installation
   A. River Cement Company, dba Buzzi Unicem USA – Selma Plant (Buzzi Unicem) shall render inoperable the equipment listed below before the date all shake down related activities for the new preheater/precalciner (PH/PC) kiln system (4-K-09) have been completed and the new kiln system becomes fully operational. However, in no instance, may this shake down period for the new kiln system exceed 180 days from the initial start-up date of the new kiln system. The emission units and operations listed below may not be operated after the new kiln system becomes fully operational without first undergoing New Source Review from the Air Pollution Control Program. This review will necessarily re-examine the netting analysis conducted for this project.

No.	Unit ID	Emission Unit Description
1.	2-R-04A	Screen (1607)
2.	2-R-04C	Screen (1607) Discharge onto Belts (1703/1744)
3.	2-R-06	TP: Belt Conveyor (1707) to Belt Conveyor (1701)
4.	2-R-11	TP: Belt 1703 to Belt Conv & Trip (1710/1732)
5.	2-R-12	TP: Trippers Discharge into Raw Feed Bins
6.	3-G-01	Raw Mill Bin Feeders to Belts (1711/1712) (3 pts.)
7.	3-G-02A	Raw Mill #1 Air Separators (2901/2902)
8.	3-G-02B	Air Slide (3204) & Belt Discharge onto Elev. (2803/ 2804
9.	3-G-03	Scale Belt (1713)
10.	3-G-04	Raw Mill #1 (3101)
11.	3-G-05	Air Slide (3204) Discharge onto Elevators (2803/2804)
12.	3-G-06	TP: Raw Mill Bin Feeders onto Belt 1742 (2 pts.)
13.	3-G-07	Raw Mill #2 Air Separator (2907)
14.	3-G-08	Raw Mill #2 (3104)
15.	3-G-09	Separator Air Slide Discharge to F-K Pumps
16.	4-K-01	Kiln Feed Alleviators (2512/2544)

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

17.	4-K-02	Cement Kilns (4001/4002)
18.	4-K-03	East CKD Tank
19.	4-K-04	Waste Dust Truck Load Spout
20.	4-K-05	Waste Dust Storage Tank
21.	4-K-06	Waste Dust Pelletizer
22.	4-K-07	Waste Dust Pile
23.	4-K-07A	Waste Dust Pile Unpaved Haul Road
24.	4-K-07B	Waste Dust Transfer Point
25.	4-K-08	R.C.G.A. Tank
26.	5-L-01	Clinker Coolers (4101/4104)
27.	5-L-02	Clinker Conveyors (3 transfer points)
28.	5-L-03A	TP: Clinker from Conveyor to Elevators (2807/2808)
29.	5-L-04	TP: Clinker from Elev. (2807/2808) to Elev. (2810/2811)
30.	5-L-07A	TP: Clinker from Belt (1716) to Belt (1714)
31.	8-B-01	Coke Barge Unloading/Truck Loading
32.	8-B-02	Haul Road: Coke from Barge Unloading to Stockpile
33.	8-B-06B	TP: Coke/Coal Belt (1730) - Furnace Storage Tank
34.	8-B-07	TP: Coke/Coal Bins (2542/2550) to Belts (2623/2634)
35.	8-B-08	Coke/Coal Crusher (1414 Inactive)
36.	8-B-09	Raw Mill Fluid Bed Furnaces 1 & 2
37.	9-M-07	Gasoline Storage Tank
38.	9-M-08	Diesel Storage Tank #1
39.	9-M-09	Diesel Storage Tank #2

B. Buzzi Unicem shall notify the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 15 days after the following events occur:

1) The date of initial start-up of the new PH/PC kiln system (4-K-09),
2) The date the shake down period ends and the new kiln system becomes fully operational or 180 days after initial start-up of the new kiln system, whichever is sooner, and
3) The date each unit listed in Special Condition Number 1.A is rendered inoperable.

2. Control Requirements for the New PH/PC Kiln System Equipment

A. Buzzi Unicem shall install baghouses on the new equipment listed below to control the particulate matter less than 10 microns in diameter (PM_{10}) emissions from these sources as specified in the permit application.

No.	Unit ID	Emission Unit Description
1.	1-Q-15	Clay/Correctives Crusher and Conveying
2.	1-Q-16	Clay Conveying to Raw Mill Feed Bins

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

3.	1-Q-17	Sand Crusher & Sand Unloading to Crusher
4.	1-Q-18	Sand Discharge from Crusher to Conveyor Belt
5.	2-R-13	Discharge from Belts 1702/1743 and Conveying to Diverter
6.	2-R-14	Raw Material Diverter to Stock Pile or Raw Mill Feed Bins
7.	2-R-15	Conveying to and Discharge into Raw Mill Feed Bins
8.	2-R-16	Discharge into Raw Mill Feed Bins from Clay & Limestone Crushing
9.	2-R-17	Discharge into Raw Mill Feed Bins from Sand Crushing
10.	2-R-18	Enclosed Limestone Stock Pile/Storage Building
11.	2-R-19	Weigh Feeder #1 from Limestone Stock Pile
12.	2-R-20	Weigh Feeder #2 from Limestone Stock Pile
13.	2-R-21	Mill Feed Bins Weigh Feeder #1 Discharge to Mill Feed Belt
14.	2-R-22	Mill Feed Bins Weigh Feeder #2 Discharge to Mill Feed Belt
15.	2-R-23	Mill Feed Bins Weigh Feeder #3 Discharge to Mill Feed Belt
16.	2-R-24	Mill Feed Bins Weigh Feeder #4 Discharge to Mill Feed Belt
17.	2-R-25	Mill Feed Bins Weigh Feeder #5 Discharge to Mill Feed Belt
18.	2-R-26	Mill Feed Bins Weigh Feeder #6 Discharge to Mill Feed Belt
19.	3-G-12	Discharge from Mill Feed Belt to Inline Raw Mill
20.	3-G-13	Inline Raw Mill
21.	3-G-14	Recirculation System from Raw Mill to Cyclones
22.	3-G-15	Raw Mill Cyclones Conveying
23.	3-G-16	Blend Silo Elevator
24.	3-G-17	Conveying to Blending Silos
25.	3-G-18	Kiln Feed Elevator Transfer to Conveyor and Discharge into Kiln Feed Bin
26.	3-G-19	Kiln Feed Bin Discharge to Preheater Elevator
27.	3-G-20	Preheater Elevator Discharge into Preheater
28.	4-K-09	PH/PC Kiln – Clinker Cooler System
29.	4-K-10	Discharge from Clinker Cooler to Conveyor
30.	5-L-11	Clinker Off-Spec Bin Conveying
31.	5-L-12	Clinker Diverters Discharge to New Clinker Conveyors
32.	5-L-13	Clinker Discharge to Belts 1716/1714

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

33.	5-L-14	Clinker Transfer to Belt 1703
34.	5-L-15	Belt 1703 to Belt Conv&Trip (1710/1732)(Old 2-R-11)
35.	5-L-16	Trippers Discharge into Converted Clinker Silos (old 2-R-12)
36.	5-L-17	Clinker Conveying to Converted Clinker Silos
37.	5-L-18	Clinker Conveying to Converted Clinker Silos
38.	6-F-07	Clinker & Gypsum Weigh Feeder #1 from Silos to FM Conveyors
39.	6-F-08	Clinker & Gypsum Weigh Feeder #2 from Silos to FM Conveyors
40.	6-F-09	Clinker & Gypsum Weigh Feeder #3 from Silos to FM Conveyors
41.	6-F-10	Clinker & Gypsum Weigh Feeder #4 from Silos to FM Conveyors
42.	6-F-11	Clinker & Gypsum Weigh Feeder #5 from Silos to FM Conveyors
43.	6-F-12	Clinker & Gypsum Weigh Feeder #6 from Silos to FM Conveyors
44.	6-F-13	Clinker & Gypsum Transfer to Conveyor & Discharge to Feed Elevator
45.	6-F-14	Transfer from Feed Elevator to Weigh Feeder & then Diverter
46.	6-F-15	Reject Bin Discharge to Conveyor & Conveyor Discharge to Elevator
47.	6-F-16	Finish Mill #3 (Large Vertical Mill)
48.	6-F-17	Discharge from Cement Coolers to Cement Silo Elevator
49.	6-F-18	Cement Silo Elevator Discharge to Cement Silos
50.	6-F-19	Finish Mill #3 Natural Gas Furnace
51.	7-C-12	New Cement Silos (2)
52.	7-C-13	Discharge from New Cement Silos to Cement Elevator and Transfer to Belt 1720
53.	7-C-14	Transfer from Belt 1720 to Surge Bin, Barge Loading Spout 5715
54.	8-B-13	Coke/Coal/Bottom Ash/Iron Ore Barge Unloading to Conveyor
55.	8-B-14	Raw Material Conveyor Transfer to Coke/Coal Pile or Covered Conveyor
56.	8-B-15	Covered Conveyor Discharge to Truck
57.	9-M-16	Discharge into CKD Hopper
58.	9-M-20	Synthetic Gypsum Hopper Loadout
59.	9-M-21	Synthetic Gypsum Conveyor Transfer to Belt 1703 &

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

1716

B. Buzzi Unicem shall modify the existing baghouses on the existing equipment listed below to control the PM_{10} emissions from these sources as specified in the permit application.

No.	Unit ID	Emission Unit Description
1.	6-F-06	F-K Pump (Finish Mills)
2.	7-C-01	Cement Storage Silos
3.	7-C-02	Cement Pump Feed Bins (2 pumps)
4.	7-C-04	Filling of Cement Storage Dome
5.	7-C-05	TP: Cement Storage Dome Loadout: Feeders-Belt 1719
6.	7-C-06	TP: Cement from Belt 1719 to Belt 1720
7.	7-C-08	Truck Loading Spout

C. Buzzi Unicem shall enclose and vent all of the emission units specified in Special Conditions 2.A and 2.B to the baghouses as specified in the permit application. The enclosure of the emissions units specified by Special Conditions 2.A and 2.B shall be constructed and maintained such that no visible emissions [zero percent (0%) opacity from the enclosure] are allowed to occur from these sources except through the gasses exiting from the baghouses.

D. The baghouses specified by Special Condition Number 2.A and 2.B must be in use at all times when that associated piece of equipment is in operation, and shall be operated and maintained in accordance with the manufacturer's specifications. These baghouses shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resources' employees may easily observe them.

E. Buzzi Unicem shall monitor and record the operating pressure drop across the baghouses specified by Special Condition Number 2.A and 2.B at least once in every 24-hour period when the associated equipment is in operation.

F. Appropriate replacement filters for each baghouse specified by Special Condition 2.A and 2.B shall be kept on hand at all times. These replacement filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

G. Buzzi Unicem shall maintain an operating and maintenance log for each baghouse indicated by Special Condition Number 2.A and 2.B which shall include the following:
   1) Incidents of malfunction(s) including the date(s) and duration of the event, the probable cause, any corrective actions taken and the impact on emissions due to the malfunction,
   2) Any maintenance activities conducted on the unit, such as parts replacement, replacement of equipment, etc., and
   3) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.

3. Best Available Control Technology (BACT) – Carbon Monoxide (CO)

A. Buzzi Unicem shall use good combustion practices at all times for the PH/PC kiln system (4-K-09) and the finish mill #3 furnace (6-F-19) in order to meet BACT.

B. Buzzi Unicem shall not emit more than 2.73 pounds of CO per ton of clinker produced from the PH/PC kiln system based on a 30-day rolling average.

C. Buzzi Unicem shall not emit more than 691.29 pounds of CO per hour of operation from the PH/PC kiln system based on a 1-hour average.

D. Buzzi Unicem shall not emit more than 2.88 pounds of CO per hour of operation from the finish mill #3 furnace.

E. Buzzi Unicem shall develop an Operating and Maintenance Manual for the finish mill #3 furnace based on manufacturer's specifications and recommendations for burner operation to ensure that good combustion practice of natural gas occurs as a routine operating practice. This manual shall be finalized prior to commencement of operation of the furnace.
   1) System operators shall be provided training on those procedures prior to operation of the furnace.
   2) A written record will be maintained detailing the names of employees, date of the initial training, and dates of subsequent review of the good combustion practice procedures.
   3) Buzzi Unicem shall make the manual available immediately to any Missouri Department of Natural Resources' personnel upon request.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

4. Continuous Emission Monitoring System (CEMS) –PH/PC Kiln System
   A. Buzzi Unicem shall install, calibrate, maintain and operate a CEMS for measuring CO emissions discharged to the atmosphere and record the output of the system for purposes of showing compliance with the CO emission limitations in Special Conditions 3.B and 3.C.

   B. The system shall be designed to meet the 40 CFR 60, Appendix B, Performance Specification 4A (PS4A) and Performance Specification 6 (PS6) requirements.

   C. The specifications of 40 CFR 60, Appendix F (Quality Assurance/Quality Control) shall apply. Appendix F requirements shall be supplemented with a quarterly notice to the Department with the dates of the quarterly cylinder gas audits and annual relative accuracy test audit.

   D. Compliance with all non-New Source Performance Standards (NSPS) CO emissions limits of this permit shall be demonstrated through the use of the required CEMS. Buzzi Unicem shall use the procedures described in 40 CFR §75.32 to determine monitor availability.
      1) The CEMS required by this permit shall be operated and data recorded during all periods of operation except for CEMS breakdown and repairs. Data will be recorded during calibration checks and zero and span adjustments, although this data should not be used for calculation of hourly values.
      2) The 1-hour average CO concentrations and flow rates measured by the CEMS required by this permit shall be used to calculate compliance with the emission standards of this permit. At least 2 data points must be used to calculate each 1-hour average.
      3) For each hour of missing CO emissions data, Buzzi Unicem shall substitute data by:
         a) Whenever the monitor data availability is equal to or greater than 95.0%, the owner or operator shall calculate substitute data by means of the automated data acquisition and handling system for each hour of each missing data period according to the following procedures:
            (1) For a missing data period less than or equal to 24 hours, substitute, as applicable, for each missing hour, the arithmetic average of the flow rates or CO concentrations recorded by a monitoring system during the previous 2,160 quality- assured monitor operating hours, as determined using the procedure in Appendix C to 40 CFR Part 75.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

(2) For a missing data period greater than 24 hours, substitute as applicable, for each missing hour, the greater of:

(a) The 90th percentile hourly flow rate or the 90th percentile CO concentration recorded by a monitoring system during the previous 2,160 quality-assured monitor operating hours, as determined using the procedure in Appendix C to 40 CFR Part 75; or

(b) The average of the recorded hourly flow rates or CO concentrations recorded by a monitoring system for the hour before and the hour after the missing data period.

b) Whenever the monitor data availability is at least 90.0% but less than 95.0%, the owner or operator shall calculate substitute data by means of the automated data acquisition and handling system for each hour of each missing data period according to the following procedures:

(1) For a missing data period of less than or equal to 8 hours, substitute, as applicable, the arithmetic average hourly flow rate or CO concentration recorded by a monitoring system during the previous 2,160 quality-assured monitor operating hours, as determined using the procedure in Appendix C to 40 CFR Part 75.

(2) For a missing date period greater than 8 hours, substitute, as applicable, for each missing hour, the greater of:

(a) The 95th percentile hourly flow rate or the 95th percentile CO concentration recorded by a monitoring system during the previous 2,160 quality-assured monitor operating hours, as determined using the procedure in Appendix C to 40 CFR Part 75; or

(b) The average of the hourly flow rates or CO concentrations recorded by a monitoring system for the hour before and the hour after the missing data period.

c) If the monitor availability is less than 90%, the owner or operator shall obtain actual emission data by an alternative testing or monitoring method approved by the Department.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

5. Stack Testing Requirements – New PH/PC Kiln System

A. Buzzi Unicem shall conduct performance testing on the new PH/PC kiln system (4-K-09) sufficient to quantify the emission rates of filterable and condensable PM_{10}, sulfur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOC) and CO from this source. These tests shall be done in accordance with the procedures outlined below.

B. Buzzi Unicem may use data collected with the required CEMS to confirm CO emission performance of the kiln in lieu of stack testing for CO if the CEMS has been certified using appropriate relative accuracy test audits (RATA) testing prior to the dates outlined below.

C. A completed Proposed Test Plan (form enclosed) must be submitted to the Air Pollution Control Program at least 30 days prior to the proposed test date of any such performance tests so that a pretest meeting may be arranged, if necessary, and to assure that the test date is acceptable for an observer to be present. The Proposed Test Plan must include specification of test methods to be used and be approved by the Director prior to conducting the above required emissions testing.

D. Within 60 days of achieving the maximum production rate of the new PH/PC kiln system, and in any case, no later than 180 days after initial start-up, the owner/operator shall have conducted the required performance tests. If one (1) or more of the above air pollutants for which testing is required by Special Condition 5.A is also required to be tested to demonstrate compliance with another applicable rule (such as 40 CFR Part 63 Subpart LLL, National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry), then Buzzi Unicem may conduct the performance testing according to the time frames indicated by the applicable regulation.

E. Any required performance testing shall be conducted during periods of representative conditions and should also be conducted at the maximum process/production rates or within ten percent (10%) of this rated capacity, not to include periods of start-up, shutdown, or malfunction. However, if a new performance testing is conducted at a production rate which is less than 90% of the maximum rated capacity of the equipment, then ten percent (10%) above the production rate at which the performance test was conducted shall become the new maximum allowable hourly production rate for the unit.

F. Two (2) copies of a written report of the performance test results must be

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

submitted to the Director within 90 days of completion of the performance testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required Environmental Protection Agency (EPA) Method for at least one (1) sample run for each air pollutant tested.

G. No later than thirty (30) days after the performance test results are submitted, Buzzi Unicem shall provide the Director with a report that establishes the potential emissions of each air pollutant tested in Special Conditions No. 5.A. This report shall report the potential emission rates in pounds per hour, tons per year and pounds per ton of clinker or cement produced from the new PH/PC kiln system (4-K-09) in order that the Air Pollution Control Program may verify the potential emissions from this project. This report shall also verify that the netting analysis remains valid when the condensable fraction of PM_{10} emissions from the new PH/PC kiln system (4-K-09) and the existing cement kilns (4-K-02) are included in the analysis.

H. If the results of the performance testing shows that the emission rates for filterable PM_{10}, total PM_{10}, SO_x, NO_X or VOC are greater than those used in the emissions analysis herein, then Buzzi Unicem shall evaluate what effects these higher emission rates would have had on the permit applicability of this project. Buzzi Unicem shall submit the results of any such evaluation in a timely manner for Air Pollution Control Program review and approval.

I. The above time frames associated with this performance testing condition may be extended upon request of Buzzi Unicem and approval by the Director.

6. Stack Testing Requirements – Existing Kiln System

A. Buzzi Unicem shall conduct performance testing on at least one of the two existing cement kilns (4-K-02) sufficient to quantify the emission rates of condensable PM_{10} from this source. These tests shall be done in accordance with the procedures outlined below.

B. A completed Proposed Test Plan (form enclosed) must be submitted to the Air Pollution Control Program at least 30 days prior to the proposed test date of any such performance tests so that a pretest meeting may be arranged, if necessary, and to assure that the test date is acceptable for an observer to be present. The Proposed Test Plan must include specification of test methods to be used and be approved by the Director

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

prior to conducting the above required emissions testing.

C. No later than 18 months after permit issuance, the owner/operator shall have conducted the required performance tests.

D. Any required performance testing shall be conducted during periods of representative conditions and should also be conducted at the maximum process/production rates or within ten percent (10%) of this rated capacity, not to include periods of start-up, shutdown, or malfunction.

E. Two (2) copies of a written report of the performance test results must be submitted to the Director within 90 days of completion of the performance testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required Environmental Protection Agency (EPA) Method for at least one (1) sample run for each air pollutant tested.

F. No later than thirty (30) days after the performance test results are submitted, Buzzi Unicem shall provide the Director with a report that establishes the potential emissions of condensable PM_{10}. This report shall report the potential emission rates in pounds per hour, tons per year and pounds per ton of clinker or cement produced from the existing kiln system (4-K-02) in order that the Air Pollution Control Program may verify the validity of the netting analysis conducted for this project upon testing of the new kiln system.

G. The above time frames associated with this performance testing condition may be extended upon request of Buzzi Unicem and approval by the Director.

7. Stack Testing Requirements – Finish Mill #3 Furnace

A. Buzzi Unicem shall conduct performance testing on the finish mill #3 furnace (6-F-19) sufficient to quantify the emission rate of CO from this source. These tests shall be done in accordance with the procedures outlined below.

B. A completed Proposed Test Plan (form enclosed) must be submitted to the Air Pollution Control Program at least 30 days prior to the proposed test date any such performance tests are conducted so that a pretest meeting may be arranged, if necessary, and to assure that the test date is acceptable for an observer to be present. The Proposed Test Plan must include specification of test methods to be used and be approved by the

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

Director prior to conducting the above required emissions testing.

C. Within 60 days of achieving the maximum production rate of the finish mill #3 furnace, and in any case, no later than 180 days after initial start-up, the owner/operator shall have conducted the required performance tests.

D. Any required performance testing shall be conducted during periods of representative conditions and should also be conducted at the maximum process/production rates or within ten percent (10%) of this rated capacity, not to include periods of start-up, shutdown, or malfunction. However, if a new performance testing is conducted at a production rate which is less than 90% of the maximum rated capacity of the equipment, then ten percent (10%) above the production rate at which the performance test was conducted shall become the new maximum allowable hourly production rate for the unit.

E. Two (2) copies of a written report of the performance test results must be submitted to the Director within 90 days of completion of the performance testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required EPA Method for at least one (1) sample run for each air pollutant tested.

F. The above time frames associated with this performance testing condition may be extended upon request of Buzzi Unicem and approval by the Director.

8. PM_{10} Emission Limits

A. Buzzi Unicem shall not emit more than 0.0085 grains per actual cubic foot (gr/ACF) of PM_{10} from any of the baghouses associated with the equipment listed in Special Conditions 2.A with the exception of the PH/PC kiln system (4-K-09) and the finish mill #3 (6-F-16).

B. Buzzi Unicem shall not emit more than 0.1925 pounds of filterable PM_{10} per ton of clinker from the PH/PC kiln system (4-K-09).

C. Buzzi Unicem shall not emit more than 1.7325 pounds of total PM_{10} per ton of clinker from the PH/PC kiln system (4-K-09).

D. Buzzi Unicem shall not emit more than 0.04 pounds of PM_{10} per ton of cement from the finish mill #3 (6-F-16).

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

E. Buzzi Unicem shall conduct performance testing on at least one of the two existing cement kilns (4-K-02), the PH/PC kiln system (4-K-09), the finish mill #3 (6-F-16) and at least ten percent (10%) by group (listed below) of the baghouses subject to the emission limit stated in Special Condition 8.A.
   1) Group 1 – All units with flow rates up to and including 3,000 acfm;
   2) Group 2 - All units with flow rates from 3,001 up to and including 7,500 acfm; and
   3) Group 3 - All units with flow rates above 7,500 acfm.

   These tests shall be done in accordance with the procedures outlined below.

F. Buzzi Unicem shall conduct performance testing on each of the modified baghouses associated with the equipment listed in Special Conditions 2.B sufficient to substantiate the use of the combined capture/control efficiency of 99% for PM_{10} emissions cited in the New Source Review permit application. These tests shall be done in accordance with the procedures outlined below.

G. A completed Proposed Test Plan (form enclosed) must be submitted to the Air Pollution Control Program at least 30 days prior to the proposed test date of any such performance tests so that a pretest meeting may be arranged, if necessary, and to assure that the test date is acceptable for an observer to be present. The Proposed Test Plan must include specification of test methods to be used and be approved by the Director prior to conducting the above required emissions testing.

H. Within 60 days of achieving the maximum production rate of the listed equipment, and in any case, no later than 180 days after initial start-up of the listed equipment (except the existing kiln system), the owner/operator shall have conducted the required performance tests.

I. Any required performance testing shall be conducted during periods of representative conditions at the maximum process/production rates or within ten percent (10%) of this rated capacity, not to include periods of start-up, shutdown, or malfunction. However, if a new performance test is conducted at a production rate which is less than 90% of the maximum rated capacity of the equipment (except the existing kiln system), then ten percent (10%) above the production rate at which the performance test was conducted shall become the new maximum allowable hourly production rate for the unit.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

J. Two (2) copies of a written report of the performance test results must be submitted to the Director within 90 days of completion of the performance testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required EPA Method for at least one (1) sample run for each air pollutant tested.

K. The above time frames associated with this performance testing condition may be extended upon request of Buzzi Unicem and approval by the Director.

L. If the performance testing required by Special Condition 8.E of this permit indicates that the PM_{10} emission rates listed in Special Condition 8.A are being exceeded, Buzzi Unicem shall

1) Correct any malfunctions discovered, and retest the unit(s) within 60 days of the initial test.
2) For each baghouse that exceeds the limits outlined in Special Condition 8.A, performance testing on an additional ten percent (10%) of the baghouses subject to the emission limits stated in Special Conditions 8.A will be required.
3) These performance tests shall be done in accordance with the procedures outlined in Special Conditions 8.G, 8.I, 8.J and 8.K.
4) These performance tests shall be conducted within 60 days of the initial test results written report submission to the Director.

M. In lieu of further testing, Buzzi Unicem may evaluate what effects these higher emission rates would have had on the permit applicability of this project. Buzzi Unicem shall use the largest outlet grain loading determined during testing and apply that rate to each of the untested baghouses associated with the equipment listed in Special Conditions 2.A with the exception of the PH/PC kiln system (4-K-09) and the finish mill #3 (6-F-16). Buzzi Unicem shall submit the results of any such evaluation in a timely manner for Air Pollution Control Program review and approval.

9. Restriction on the Maximum Amount of Clinker Production Allowed From the PH/PC Kiln System

A. Buzzi Unicem shall not produce over 2,220,000 tons of clinker from the PH/PC kiln system (4-K-09) in any consecutive 12-month period.

B. Buzzi Unicem shall maintain an accurate record of clinker production from the PH/PC kiln system (4-K-09). The installation shall record the monthly and running 12-month totals of clinker production from this emission unit.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

10. Haul Road Paving/Sweeping
    A. Buzzi Unicem shall pave the haul roads (4-K-11 and 4-K-13) with materials such as asphalt, concrete, and/or other materials(s). The pavement will be applied in accordance with industry standards. The paving shall be completed prior to the startup of the new PH/PC kiln system.

    B. Maintenance and/or repair of the surfaces will be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these areas while the plant is operating.

    C. The operator(s) shall periodically water, wash and/or otherwise clean all of the paved portions of the haul road(s) as necessary to achieve control of fugitive emissions from these areas while the plant is operating.

11. Revised Maximum Allowable Hourly Production Rate – #1 Finish Mill Air Separators
    Buzzi Unicem shall not operate the existing #1 finish mill air separators (6-F-04B) at a rate greater than 97.0 tons of cement per hour upon issuance of this permit. Operation at a higher rate shall not occur without first obtaining a New Source Review permit from the Air Pollution Control Program.

12. Operational Requirement – Enclosed Limestone Stockpile/Storage Building
    A. Buzzi Unicem shall keep all doors, windows, and other openings to the ambient air of the enclosed limestone stockpile/storage building (2-R-18) closed at all times while in operation and for 30 minutes subsequent to the shutdown of the unloading conveyor system (2-R-18) to allow settling of PM_{10} to occur.

    B. Should maintenance personnel be required to enter the enclosed limestone stockpile/storage building (2-R-18) while the unloading conveyor system (2-R-18) is in operation, or during the 30 minute settling period, doors shall not remain open for any reason other than to allow passage into and out of the building.

    C. Buzzi Unicem shall maintain an operating and maintenance log for the stockpile/storage building which shall include the following:
        1) Incidents of malfunction(s) including the date(s), time and duration of the event, the probable cause, any corrective actions taken and the impact on emissions due to the malfunction, and

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

2) Any maintenance activities conducted on the unit, such as parts replacement, replacement of equipment, etc.

13. Restriction on Type of Material Processed

A. Buzzi Unicem shall not process any material other than limestone in the primary crusher (1-Q-10) and secondary crusher (2-R-03B) except during emergency periods when the sand crusher (1-Q-17) or clay/correctives crusher (1-Q-15) are rendered inoperable.

B. During emergency periods defined above, Buzzi Unicem shall not process more than 35,000 tons each of sand and clay/correctives on a rolling 12-month average through the existing primary crusher (1-Q-10) and secondary crusher (2-R-03B).

C. Buzzi Unicem shall maintain an accurate record of the quantity of sand and clay/corrective materials processed in the existing primary crusher (1-Q-10) and secondary crusher (2-R-03B). The installation shall record the monthly and running 12-month totals of sand, clay/corrective materials processed through the primary and secondary crushers.

D. Buzzi Unicem shall maintain an operating and maintenance log for the sand crusher (1-Q-17) and clay/correctives crusher (1-Q-15) which shall include the following:

1) Incidents of malfunction(s) including the date(s), time and duration of the event, the probable cause, any corrective actions taken and the impact on emissions due to the malfunction, and
2) Any maintenance activities conducted on the units, such as parts replacement, replacement of equipment, etc.

14. Record Retention Requirements

Buzzi Unicem shall maintain all records required by this permit, on-site, for the most recent 60 months of operation and shall make such records available immediately to any Missouri Department of Natural Resources' personnel upon request.

15. Restriction of Public Access

A. Buzzi Unicem shall preclude all public access to the area surrounding the "core plant" as declared in the modeling analysis, and as shown in Appendix A, Figure 1 entitled "River Cement Company, dba Buzzi Unicem USA – Selma Plant – Plant Operation Area". Buzzi Unicem shall submit documentation to demonstrate preclusion to the Air Pollution Control Program for review and approval.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

B. Buzzi Unicem shall employ one or more of the following measures to ensure adequate restriction of public access to the "core plant":

1) Fencing sufficient to prevent unknowing entry by unescorted and/or unauthorized persons. Any unmanned accessways in the fence shall be kept closed at all times, except to allow access by authorized persons.
2) A remote monitoring surveillance system (e.g. surveillance cameras) capable of providing for monitoring of unrestricted sections of the perimeter of the "core plant", and at least hourly observation of surveillance monitors for the presence of unescorted and/or unauthorized persons. Such observations must be conducted by personnel specifically trained to be aware of trespassers in the "core plant" and to initiate actions for the removal of trespassers upon discovery.
3) Inspection at least once every two hours of any unrestricted sections of the perimeter of the "core plant." Such inspections must be conducted by personnel specifically trained to be aware of trespassers in the "core plant" and to initiate actions for the removal of trespassers upon discovery.
4) An alternative approach to restriction approved by the Director, in writing.

C. Buzzi Unicem shall maintain records which shall include the following:

1) A current list of personnel trained to perform surveillance of the "core plant",
2) Documentation of training received by such personnel, and
3) Observation/inspection logs detailing any trespassers encountered.

16. Placement of Sources and Buildings

Buzzi Unicem shall submit new modeling files to the Air Pollution Control Program for further analysis should the placement of emission units and buildings change from the configuration submitted for review on February 24, 2005.

17. Reporting

A. Buzzi Unicem shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after the day in which emissions exceed the limits established by this permit.

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

B. Buzzi Unicem shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after the day in which operation of equipment at this installation is not in accordance with any operational limitation or condition established by this permit.

C. Buzzi Unicem shall comply with the requirements of 10 CSR 10-6.050 with regard to Start-Up, Shutdown and Malfunction Conditions.

D. Buzzi Unicem shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than ten (10) days after the date in which it is discovered that emission factors used in this permit (or permit application) underestimated actual emissions.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (8) REVIEW
Project Number: 2004-12-050
Installation ID Number: 099-0002
Permit Number:

River Cement Company,
dba Buzzi Unicem USA - Selma Plant
1000 River Cement Road
Festus, MO 63028

Complete: December 22, 2004
Reviewed: July 28, 2005

Parent Company:
Buzzi Unicem USA, Inc.
100 Brodhead Road
Bethlehem, PA 18017

Jefferson County, S40N, T23, R6E

REVIEW SUMMARY

- Buzzi Unicem has applied for authority to construct a single new clinker production line that will operate with an in-line raw mill and PH/PC kiln system to replace two (2) existing long-dry clinker production systems and their attending raw mill systems, in addition to adding finish grinding capacity.

- Hazardous Air Pollutant (HAP) emissions are expected from the increase in clinker production levels. HAPs of concern from the cement manufacturing processes are lead, beryllium, mercury, fluorides, benzene and hydrogen chloride. However, the HAP emitting units at the installation are governed by the requirements of a Maximum Achievable Control Technology (MACT) standard; therefore a Missouri Section (9) review is not required.

- Subpart OOO, *Standards of Performance for Nonmetallic Mineral Processing Plants*, of the NSPS applies to some of the proposed equipment. Subpart Y, *Standards of Performance for Coal Preparation Plants*, applies to some of the coal handling equipment.

- The MACT standard, 40 CFR Part 63, Subpart LLL, *National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry,* applies to some of the proposed equipment.

- Various types of dust control devices will be used to control the PM_{10} emissions from the new equipment being added under this permit.

- Buzzi Unicem is an existing major source for criteria pollutants. The potential emissions for this project were initially calculated to be above the major source level for PM_{10} [15.0 tons per year (tpy)], SO_x (40.0 tpy), NO_x (40.0 tpy), CO (100.0 tpy), VOC (40 tpy) and beryllium (0.0004 tpy). Beryllium was removed from the list of currently regulated pollutants subject to Federal PSD review as of December 31, 2002 (Federal Register, Part III, EPA 40 CFR Parts 51 and 52, *PSD and NSR; Final Rule and Proposed Rule*). The potential emissions of lead, mercury and fluorides were calculated to be below their respective significant levels. A net emissions increase analysis was submitted for PM_{10}, SO_x, NO_x, CO, VOC and beryllium in which the company proposed to remove two (2) existing long-dry clinker kilns at the installation. This net emissions increase analysis demonstrated that this project would not exceed the significant threshold associated with major review for PM_{10}, SO_x, NO_x, VOC or beryllium. However, this review was conducted in accordance with Section (8) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of CO from the project are above de minimis levels.

- The BACT requirements apply to the proposed equipment that emits CO. CO emissions from the PH/PC kiln system and the finish mill #3 furnace will be controlled through the use of good combustion practices.

- This installation is located in Jefferson County, which is currently considered to be a maintenance area for the 1-hour ozone (O_3) standard and nonattainment for the 8-hour O_3 standard. The area is also a Prevention of Significant Deterioration (PSD) baseline area for PM_{10}, sulfur dioxide (SO_2) and NO_x.

- This installation is on the List of Named Installations [10 CSR 10-6.020(3)(B), Table 2, Number 3, *Portland Cement Plants*].

- Air quality modeling for this project was performed to determine the ambient impact of CO that will be emitted in significant amounts. Based upon the model reviewed by the Air Pollution Control Program staff, the study submitted by Buzzi Unicem is complete and demonstrates there will not be an exceedance of the National Ambient Air Quality Standards (NAAQS) or available increment.

- Ambient air monitoring was not required for this project since the modeling analysis indicated that the ambient impacts of the modeled pollutants were below significant thresholds.

- Emissions testing is required for several pieces of the new equipment subject to a NSPS or MACT standard. Several pieces of existing equipment will need to be retested due to increased utilization of the equipment. Testing is also required for the new PH/PC kiln system, to quantify emission rates of PM_{10}, SO_x, NO_x, CO and VOC.

- Revision to the Part 70 Operating Permit application is required for this installation within 1 year of equipment startup.

- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Buzzi Unicem currently operates a Portland cement manufacturing installation in Festus, Missouri that performs quarrying and crushing of raw materials, and processing of these materials into Portland cement via two (2) cement-production systems. These systems are described in detail below and consist of equipment to prepare raw material into pyro-process kiln feed (Raw Grinding), process kiln feed into clinker (Burning), prepare raw fuel for combustion (Fuel Grinding), and process clinker into cement (Finish Grinding). Once the final cement is produced, both production systems use common bulk storage and distribution systems.

- Quarry – Crushing
  Limestone is quarried on the plant property; corrective materials, such as sandstone, clay, iron-rich minerals, silica-bearing materials, and other materials are received from off-site sources. Raw materials are introduced to a single gyratory-type primary crusher that crushes these to a material size of less than six (6) inches in diameter. From this unit, material is conveyed into two (2) parallel hammer-type secondary crushers that further reduce the maximum particle size to less than 1 inch in diameter. The materials are then individually conveyed via belt conveyors to several silos/bins for temporary storage. From these storage units the raw materials are extracted and conveyed to one (1) of two (2) parallel and substantially identical cement-production systems that can operate independently or concurrently.

- Raw Grinding
  For each cement-production system, the crushed raw materials are extracted from storage in pre-determined ratios and conveyed via a belt conveyor into a Raw Grinding system, where the combined materials are dried and pulverized. The grinding takes place in a tubular-type ball mill, where the materials are reduced to a fine powder. The drying and the separation of the finished product take place in a dynamic separator. A coal/coke-fired furnace provides the heat required for drying the raw materials. In the dynamic separator the hot air stream is forced through sets of rotating blades that remove oversized particles that are subsequently returned to the mill system for further grinding. Sufficiently ground material – kiln feed – exits the system and is conveyed pneumatically for blending into 4 kiln feed silos, common for both Raw Grinding systems, for temporary storage. Process air and water vapor from the mill and the separator are treated in baghouses prior to release to the atmosphere.

- Clinker Burning
  From the kiln feed silos, the kiln feed is pneumatically conveyed into each long dry-process rotary kiln for pyro-processing into cement clinker nodules. The kiln feed is introduced at the upper, or “cold”, end of the kiln and travels downhill via the kiln rotation and gravity. Fuel (primarily coal and/or coke) is fired at the lower, or “hot”, end of the kiln and the resulting combustion gases travel countercurrent to the feed via an induced draft fan. The kiln system can also be fired with natural gas. This fuel is typically used only during kiln start-up or during upsets as supplemental fuel. The gas is hard-piped to the kiln floor and fed via a separate firing lance into the main burner assembly at the hot end of the kiln.

As the kiln feed is gravity-conveyed through the kiln it is progressively heated and undergoes calcination and sintering processes. When the material reaches the hot end of the kiln it has completed a chemical transformation into Portland cement clinker nodules, typically sized between ½ - inch and 2-inches in diameter. The clinker nodules are deposited directly from the hot-end of the kiln into the clinker cooler system.

The kiln gases exit the cold end of each kiln and are treated in two (2) electrostatic precipitators per kiln located in series, where particulate matter (PM) is separated and recovered, prior to being vented to atmosphere through a single main process stack.

- Clinker Cooling
  Clinker discharged from the kiln passes through a forced-air, reciprocating Clinker Cooler. The majority of the spent cooling air is forced into the hot end of the kiln to provide the oxygen for combustion. A portion of the heated air is also diverted to the fuel grinding process for use as drying air. Excess spent air is passed through fabric filters before venting to atmosphere. The cooled clinker is conveyed to either a covered storage area or to storage silos that feed the Finish Grinding process. From the covered clinker storage building, clinker is reclaimed via underground vibrating feeders and conveyed via belt conveyors, bucket elevators and drag chain conveyors to the clinker storage silos.

- Fuel Grinding
  Solid fuel is currently delivered to the installation and placed in stockpiles for storage. The fuel is reclaimed by front-end loaders and conveyed via conveyor belts to intermediate storage tanks. The fuel is reclaimed from each intermediate tank and conveyed by drag chain and screw conveyors to a tubular-type ball mill for drying and grinding. A slipstream of hot air from either clinker coolers is diverted to the mill for use as both drying and sweep air. Ground fuel entrained in the drying/sweep air is transported, via the air stream, to a dynamic separator. In the separator, the air stream will pass through sets of rotating blades that will remove oversized particles of solid fuel, which will be returned to the mill system for further grinding. Process air and water vapor from the mill and the separator are treated in fabric filters prior to release into the atmosphere. The finely ground fuel is conveyed to, and collected in, two (2) pulverized fuel storage tanks, one (1) tank providing fuel to each kiln system. The pulverized fuel is metered from the storage tanks and is conveyed to the burner of each kiln via pneumatic conveying. The mix of fuel and conveying air is deployed through the burner into the kiln's combustion zone.

- Finish Grinding
  In the Finish Grinding process, gypsum is ground with clinker to produce cement. Gypsum is received at the plant by barge, and conveyed by trucks to an outdoor gypsum storage pile. Gypsum is then unloaded from the pile into a hopper and transferred via belt conveyors and bucket elevators to gypsum storage silos.

  Clinker and gypsum are extracted from their respective storage silos, metered and fed in predetermined proportions into a tubular-type mill. A high molecular weight organic compound solution is also injected to the mill to aid in the grinding process. The clinker/gypsum blend is introduced to the mill where it is pulverized. Sweep air is introduced to the mill to entrain ground cement particles and carry them to the cement separator system. In the separator, the air stream passes through sets of rotating blades that remove oversized particles of clinker and gypsum and causes them to return to the mill system for further grinding. Sufficiently ground particles of clinker and gypsum are transported by the air stream into fabric bag filters; the clean air passes through the fabric bag and is released into the atmosphere, while the material particles are trapped on the outside of the fibers of the fabric bag. Jet pulses of compressed air are periodically forced inside the fabric bag, causing the material particles to dislodge and fall into the fabric filter hopper, where they are collected and conveyed via rotating screw conveyors to either a cement cooler or to a pneumatic conveying system. The ground clinker and gypsum particles mix, or Portland cement, are processed for cooling through a cement cooler for temperature control, and are then pneumatically conveyed to either cement storage silos or to a cement storage monolithic dome.

The Portland cement is gravity withdrawn, and shipped off-site via barges, railcars and trucks. Air-gravity conveyors are used for truck loading and railcar operations; barges are loaded using either a pneumatic conveying system or belt conveyors.

Buzzi Unicem, formerly known as River Cement Company, is considered to be an existing major source of air pollutants for New Source Review (NSR) purposes and a Part 70 source for Operating Permit purposes. Buzzi Unicem submitted a Part 70 Operating Permit application for the cement manufacturing plant on May 14, 1997, and Permit No. OP2000-112 was issued on November 6, 2000. The following NSR permits and amendments have been issued to River Cement Company from the Air Pollution Control Program.

Table 1: New Source Review Permits and Amendments

Permit Number	Description
122003-008	A Section (5) permit issued for the replacement of the direct-fired solid fuel systems used on the existing cement kilns with an indirect-fired solid fuel mill/feed system.
052002-013	A Section (5) permit issued for the replacement of four (4) existing air separators at Finish Mill Number 1 and Finish Mill Number 2 with two (2) air separators of a slightly larger capacity.
1299-018	A temporary permit issued to conduct a test program of oxygen enrichment to the combustion zone of the cement kiln.
0693-008	A Section (5) permit issued for the modifications of fuel storage permit 0687-13A and fuel utilization permit 1288-004A. This permit was issued in order to allow for a change in the total number and volume of tanks, for an increase in the annual fuel storage and utilization quantity, for the addition of a vacuum operated truck, railcar, and on site container cleaning facility and for the addition of another burner system to each kiln for the direct burning of a high viscosity liquid (HVL) waste fuel.
0293-006	A Section (5) permit issued to increase the cement storage capacity by one (1) silo with the addition of a reclaim conveyor and five (5) dust collectors.
0687-013B	An amendment to Permit No. 0687-013A issued for the modification of a waste fuel storage permit.

1288-004A	An amendment issued to modify the hazardous waste combustion Permit No. 1288-004.
0687-013A	An amendment issued to modify Permit No. 0687-013 to allow the installation and operation of three (3) 22,000 gallon and six (6) 39,000 gallon storage tanks in place of the ten (10) 30,000 gallon storage tanks originally permitted.
1288-004	A Section (5) permit issued on December 9, 1988, to allow River Cement Company to burn hazardous waste fuel D001 [ignitable, nonlisted hazardous waste]. This submittal covers the physical burning of the fuel. (Ref. J.Pintor, RC, letter to M.Stansfield, MDNR, 1/29/87) "Peripherals necessary to allow a cement kiln to burn hazardous waste fuel. These include a fuel supply system and an oxygen monitor in the kiln stack."
0687-013	A Section (5) permit issued on June 29, 1987 for construction of storage tanks associated with the burning of hazardous waste fuel D001 [ignitable, nonlisted hazardous waste], (Ref. J.Pintor, RC, letter to M.Stansfield, MDNR, 1/22/87). Construction of ten (10) 30,000 gallon tanks for storage of hazardous waste fuel.

Buzzi Unicem entered into a settlement agreement at the beginning of 2004 with the Air Pollution Control Program due to repeated instances of excess PM emissions from the installation. Excess emissions have emanated from the installation's electrostatic precipitator, kiln stacks and dust collectors. In addition, emissions monitoring equipment was found to have excessive downtime. The settlement agreement contains a formal Air Quality Compliance Plan that contains several deadlines and specific actions that Buzzi Unicem must meet. Since the settlement agreement has taken effect, two (2) additional notice of excess emissions have been issued: 014CN1 and 1104CN1. Incidences of excessive emissions should be eradicated with the removal of the two (2) existing kilns associated with this project.

PROJECT DESCRIPTION

Buzzi Unicem is proposing to replace both long-dry clinker production systems and their attending raw mill systems, with a single new clinker production line that will operate with an in-line raw mill. In addition, Buzzi Unicem is proposing to increase capacity to produce cement by adding finish-grinding capacity. The following discussion provides a description of the changes to be made to the existing plant configuration.

- Quarry – Crushing
  No changes to the equipment or procedures are expected for the quarry operations. Additionally, the existing primary and secondary crushing systems will not be physically modified. However, while they currently process all raw materials, after the proposed project is completed, they will be used primarily to process limestone. Other raw materials will only be processed under emergency back-up situations.

  A new crushing system will be installed solely for the processing of clay and corrective materials. This system will include two (2) crushers; one for clay and corrective materials, the other for sand; and attending conveying systems to transport the materials during and after processing. This new system may be used in emergency back-up situations to process limestone also.

- Raw Materials Storage
  While the acquisition and receipt of raw materials will be conducted under existing procedures, a new storage hall will be constructed for limestone and clay storage, and new silos will be constructed for the other corrective materials. Raw materials will be extracted from their respective storage units in metered quantities by belt weigh feeders and conveyed to the raw grinding system by means of belt conveyors.

- Raw Grinding
  A new in-line raw grinding system will be installed to process raw materials into kiln feed, replacing the two (2) existing raw mill systems. Raw materials will be conveyed from the storage hall and silos via a system of belt conveyors and elevators to the new grinding system. The mill will be of the in-line design where hot combustion gases from the kiln system are forced into the raw grinding system with the dual function of drying the materials during grinding and to sweep the finely ground particles from the grinding system. The particles are carried through a dynamic separator system similar in function to those described above. The off-gases from the in-line mill system will be combined with the vent air from the clinker cooler, and directed to a fabric filter baghouse. All material collected by the baghouse will be conveyed to the existing kiln feed silos via air gravity feeders and elevators, while the clean gases leaving the baghouses will be vented to atmosphere through a common stack.

- Clinker Burning/Cooling
  From the kiln feed silos, feed will be conveyed via a system of air gravity conveyors and elevators to a new PH/PC kiln system. The kiln feed will be introduced at the top of the preheater tower that supports a vertically stacked series of cyclones. The kiln feed will travel countercurrent to the upward flow of the combustion gases from the kiln. Heat is transferred from the kiln gases to the kiln feed as the kiln feed moves downward through each cyclone. On exiting the bottom-most cyclone vessel, the partially calcined feed will enter the rotary kiln. As in the traditional long-dry kiln, rotation and gravity conveys the material along the entire length of the kiln where the calcination and sintering processes are completed. When the kiln feed reaches the hot end of the kiln it has undergone a chemical transformation into Portland cement clinker nodules.

  The kiln feed equipment needs to be sized to a higher maximum hourly design rate (MHDR) than the kiln itself for the following reasons:

  An internal re-circulation of material occurs due to the effect of kiln exhaust stripping feed from the input stream at the top of the preheater tower. The stripped material is carried to and captured by the air pollution control device. From the air pollution control device, the material is returned back to the kiln feed delivery system together with newly introduced feed creating an increased load to the system.

  Over-sizing the kiln feed input equipment provides for greater reliability in consistently meeting feed demand of the process, since the equipment will not need to operate at max capacity in ensuring sufficient feed to the kiln system.

The kiln gases exit the upper end of the preheater tower and are forced through the Raw Grinding system when this system is operating or they by-pass the Raw Grinding system. In either case, the kiln gases are routed to a mixing chamber where they are combined with the vent air from the clinker cooler. This occurs prior to the kiln gases being treated by a fabric filter control device that vents to the atmosphere through the new kiln stack. Clinker discharged from the kiln will pass through a forced-air, reciprocating grate clinker cooler.

Coal/petroleum coke will be fired in the precalciner vessel (i.e. the lowest stage of the cyclone tower) and simultaneously at the hot end of the kiln to provide the required energy for the burning process. The kiln system can also be fired with natural gas. This fuel will typically be used only during kiln start-up or during upsets as supplemental fuel.

- Fuel Grinding
  No changes are expected to the equipment currently permitted for use in processing and transporting fuel to the two (2) existing kiln systems. However, under operation of the new PH/PC kiln system, one of the existing tanks will be used to provide fuel to the rotary kiln and the other will be used to provide fuel to the precalciner vessel.

- Clinker Handling and Storage
  The cooled clinker will be conveyed via a system of pan conveyors, belt elevators and belt conveyors to either the existing covered storage building or clinker storage silos, including new silo capacity resulting from conversion of existing raw feed silos.

  Clinker cooling/handling equipment needs to be sized to a higher MHDR than the kiln because, on a short-term basis, the quantity of material input to the kiln typically will not equal the quantity of material being discharged to the cooler. The kiln MHDR reflects the rate at which the kiln system can pyro-process raw meal into clinker and is not necessarily related to the short-term rate at which that clinker will exit the kiln. There are many routine operating conditions that can either impede or accelerate the clinker discharge rate. Some examples include:

  As the raw feed is transformed from calcium carbonate to calcium silicates, it will progress through a phase where the material will have an affinity to adhere to the interior surface of the kiln. As the temperature of the load increases, more feed sticks to the side of the kiln and more material is retained in the kiln. As the temperature of the load decreases, less feed sticks to the kiln lining and the accumulation of feed progresses through the kiln.

  A gradual build-up of coating on the refractory liner may also occur. As this coating continues to build in mass, it reaches a point where the coating will become too heavy to continue adhering to the refractory and slough off into the clinker bed. This “slug” of coating can be several tons to tens of tons in volume. As the “slug” is discharged to the cooler, the quantity of clinker entering the cooler can easily exceed the MHDR of the kiln for a brief period.

- Finish Grinding
  Gypsum will continue to be received at the plant as it is now. However, additional gypsum storage will be created through conversion of existing Raw Feed silos. A new synthetic gypsum production process will also be added which will use cement kiln dust (CKD) as a major constituent of the synthetic gypsum.

  The two (2) existing Finish Grinding systems will not be modified. However, a third new Finish Grinding system will be added as part of the proposed project.

- Cement Barge Shipping Facilities
  The cement distribution system will be upgraded with the construction of new cement silos feeding the existing barge loading belt conveying system and the existing barge loading hopper modified for the higher volume. The existing pneumatic cement conveying lines will be used to convey cement to the new silos. Air gravity conveyors will be used to transfer cement from the silos to the existing belt conveying system currently employed to load barges from the cement storage dome.

- Barge Unloading System
  A new barge unloading system will be installed as part of the proposed project. Materials received at the plant by barge will be unloaded by a dedicated crane unloading system transferring the materials on to a new belt conveying system. Coal or petroleum coke will be deposited on a stockpile directly from the belt conveying system, while raw materials will be transferred to a loading hopper and from there to trucks.

A listing of the new equipment/processes being added under this permit are identified in Table 2 below.

Table 2: New Emission Units/Processes Associated with this Permit

No.	Unit ID	Description of Unit	Maximum Hourly Design Rate (MHDR)	Control Device ID	Control Device Description
		Quarry			
1	1-Q-15	Clay/Correctives Crusher and Conveying	330.7	TB-01	Baghouse
2	1-Q-16	Clay Conveying to Raw Mill Feed Bins	330.7	TB-02	Baghouse
3	1-Q-17	Sand Crusher & Sand Unloading to Crusher	330.7	TB-03	Baghouse
4	1-Q-18	Sand Discharge from Crusher to Conveyor Belt	330.7	TB-04	Baghouse
		Raw Material Handling and Storage			
5	2-R-13	Discharge from Belts 1702/1743 and Conveying Diverter	1,200	TB-11	Baghouse
6	2-R-14	Raw Material Diverter to Stockpile or Raw Mill Feed Bins	1,200	TB-12	Baghouse
7	2-R-15	Conveying to and Discharge into Raw Mill Feed Bins	1,200	TB-13	Baghouse
8	2-R-16	Discharge into Raw Mill Feed Bins from Clay and Limestone Crushing	1,200	TB-14	Baghouse

9	2-R-17	Discharge into Raw Mill Feed Bins from Sand Crushing	1,200	TB-15	Baghouse
10	2-R-18	Enclosed Limestone Stockpile/Storage Building (Raw Material Longitudinal)	1,200	TB-16	Baghouse
11	2-R-19	Weigh Feeder #1 from Limestone Stockpile	689.0	TB-17	Baghouse
12	2-R-20	Weigh Feeder #2 from Limestone Stockpile	689.0	TB-18	Baghouse
13	2-R-21	Mill Feed Bins Weigh Feeder #1 Discharge to Mill Feed Belt	689.0	TB-19	Baghouse
14	2-R-22	Mill Feed Bins Weigh Feeder #2 Discharge to Mill Feed Belt	689.0	TB-20	Baghouse
15	2-R-23	Mill Feed Bins Weigh Feeder #3 Discharge to Mill Feed Belt	689.0	TB-21	Baghouse
16	2-R-24	Mill Feed Bins Weigh Feeder #4 Discharge to Mill Feed Belt	689.0	TB-22	Baghouse
17	2-R-25	Mill Feed Bins Weigh Feeder #5 Discharge to Mill Feed Belt	689.0	TB-23	Baghouse
18	2-R-26	Mill Feed Bins Weigh Feeder #6 Discharge to Mill Feed Belt	689.0	TB-24	Baghouse
Raw Grinding and Kiln Feed					
19	3-G-12	Discharge from Mill Feed Belt to Inline Raw Mill	689.0	TB-25	Baghouse
20	3-G-13	Inline Raw Mill	689.0	TB-33	Baghouse
21	3-G-14	Recirculation System from Raw Mill to Cyclones	689.0	TB-26	Baghouse
22	3-G-15	Raw Mill Cyclones Conveying	689.0	TB-27	Baghouse
23	3-G-16	Blend Silo Elevator (Discharge from Cyclones Conveying & Large Dust Collector)	689.0	TB-28	Baghouse
24	3-G-17	Conveying to Blending Silos	689.0	TB-29	Baghouse
25	3-G-18	Kiln Feed Elevator Transfer to Conveyor and Discharge into Kiln Feed Bin	536.0	TB-30	Baghouse
26	3-G-19	Kiln Feed Bin Discharge to Preheater Elevator	536.0	TB-31	Baghouse
27	3-G-20	Preheater Elevator Discharge into Preheater	536.0	TB-32	Baghouse
Preheater – Kiln – Cooler					
28	4-K-09	PH/PC Kiln – Clinker Cooler System	330.7	TB-33	Baghouse
29	4-K-10	Discharge from Clinker Cooler to Conveyor	443.0	TB-37	Baghouse
30	4-K-11	Haul Road (Paved) Calcium Hydroxide Entrance to Bin	7.8 VMT/hr	N/A	Sweeping
31	4-K-12	Calcium Hydroxide Tank and Discharge to Preheater	75.0	N/A	N/A
32	4-K-13	Haul Road (Paved) Ammonia Hydroxide Entrance to Tank	2.6 VMT/hr	N/A	Sweeping
33	4-K-14	Ammonia Hydroxide Tank	500 gals	N/A	N/A
Clinker Handling					
34	5-L-11	Clinker Off Spec Bin Conveying	443.0	TB-38	Baghouse
35	5-L-12	Clinker Diverters Discharge to New Clinker Conveyors	443.0	TB-39	Baghouse
36	5-L-13	Clinker Discharge to Belts 1716/1714	443.0	TB-40	Baghouse
37	5-L-14	Clinker Transfer to Belt 1703	443.0	TB-41	Baghouse
38	5-L-15	Belt 1703 to Belt Conv & Trip (1710/1732) (old 2-R-11)	443.0	2215 2262	Baghouse
39	5-L-16	Trippers Discharge into Converted Clinker Silos (old 2-R-12)	443.0	220109 220111 220113 220115	Baghouse
40	5-L-17	Clinker Conveying to Converted Clinker Silos	443.0	TB-42	Baghouse
41	5-L-18	Clinker Conveying to Converted Clinker Silos	443.0	TB-43	Baghouse
Finish Mill #3 – New Large Vertical Mill					
42	6-F-07	Clinker & Gypsum Weigh Feeder #1 from Silos to FM Conveyors	242.0	TB-44	Baghouse

43	6-F-08	Clinker & Gypsum Weigh Feeder #2 from Silos to FM Conveyors	242.0	TB-45	Baghouse
44	6-F-09	Clinker & Gypsum Weigh Feeder #3 from Silos to FM Conveyors	242.0	TB-46	Baghouse
45	6-F-10	Clinker & Gypsum Weigh Feeder #4 from Silos to FM Conveyors	242.0	TB-47	Baghouse
46	6-F-11	Clinker & Gypsum Weigh Feeder #5 from Silos to FM Conveyors	242.0	TB-48	Baghouse
47	6-F-12	Clinker & Gypsum Weigh Feeder #6 from Silos to FM Conveyors	242.0	TB-49	Baghouse
48	6-F-13	Clinker & Gypsum Transfer to Conveyor and Discharge to Feed	242.0	TB-50	Baghouse
49	6-F-14	Transfer from Feed Elevator to Weigh Feeder and then Diverter	297.0	TB-51	Baghouse
50	6-F-15	Reject Bin Discharge to Conveyor and Conveyor Discharge to Elevator	242.0	TB-52	Baghouse
51	6-F-16	Finish Mill #3 (Large Vertical Mill)	242.0	TB-53	Baghouse
52	6-F-17	Discharge from Cement Coolers to Cement Silo Elevator	242.0	TB-54	Baghouse
53	6-F-18	Cement Silo Elevator Discharge to Cement Silos	242.0	TB-55	Baghouse
54	6-F-19	Finish Mill #3 Natural Gas Furnace	0.034 MMCF/hr	TB-53	Baghouse
Cement Distribution					
55	7-C-12	New Cement Silos (2)	750.0	TB-56	Baghouse
56	7-C-13	Discharge from New Cement Silos to Cement Elevator and Transfer to Belt 1720	750.0	TB-57	Baghouse
57	7-C-14	Transfer from Belt 1720 to Surge Bin, Barge Loading Spout 5715	750.0	TB-58	Baghouse
Coal/Coke Handling					
58	8-B-13	Coke/Coal/Bottom Ash/Iron Ore Barge Unloading to Conveyor	200.0	TB-59	Baghouse
59	8-B-14	Raw Material Conveyor Transfer to Coke/Coal Pile or Covered Conveyor (Iron Ore/Bottom Ash to Covered Conveyor)	200.0	TB-60	Baghouse
60	8-B-15	Covered Conveyor Discharge to Truck (Bottom Ash/Iron Ore)	200.0	TB-61	Baghouse
Synthetic Gypsum Handling					
61	9-M-13	Gasoline Storage Tank	560 gals	N/A	N/A
62	9-M-14	Diesel Storage Tank	560 gals	N/A	N/A
63	9-M-15	Kerosene Storage Tank	560 gals	N/A	N/A
64	9-M-16	Discharge into CKD Hopper	200.0	TB-62	Baghouse
65	9-M-17	Pug Mill/Mixer	200.0	N/A	N/A
66	9-M-18	Conveyor Transfer from Pug Mill to Storage Building	200.0	N/A	N/A
67	9-M-19	Synthetic Gypsum Storage Building	200.0	N/A	N/A
68	9-M-20	Synthetic Gypsum Hopper Loadout	200.0	TB-63	Baghouse
69	9-M-21	Synthetic Gypsum Transfer to Belt 1703 & 1716	200.0	TB-64	Baghouse

N/A = Not Applicable

Net Emissions Increase Analysis

Buzzi Unicem River Cement Company requested to conduct a net emissions increase analysis for the criteria pollutants: PM_{10}, SO_x, NO_X, CO and VOC in their permit application, as well as for beryllium. A net emissions increase analysis examines all the emission increases and decreases that have occurred at the installation for the air pollutants of concern during a contemporaneous time period. The amount of these emission increases and decreases are determined by finding the actual emissions (average of a representative two-year period), if available. Typically, if there are not two (2) years of actual emissions data for an emissions unit, the potential emissions for the unit are used instead.

In this instance, actual emissions data were taken from the 2000 and 2003 EIQ submittals. Neither 2001 nor 2002 were representative years. In 2001, the installation experienced a failure on the frame of one of the kiln trunions on Kiln 1. The unit required replacement resulting in an extended unscheduled shutdown and a significant loss of production. Additionally, severe cold weather hampered shipping on the Mississippi River and prevented the installation from both receiving materials into the facility and shipping product from the facility. In 2002, a failure of a kiln tire on Kiln 2 caused the installation to operate at reduced rates for nearly one (1) month, followed by a 3-week shutdown of the kiln for replacement of the tire.

After the netting analysis has determined the amount of actual or potential emissions for all of the units where increases and decreases have occurred, or will occur during this period, the increases are added together and the decreases are subtracted from this total. If the resulting level of emissions from the netting analysis is below the significant level for that air pollutant, then the project is evaluated as a de minimis review instead of a PSD review.

This contemporaneous period is defined as the previous five (5) year period from the date the construction on the project begins (i.e. permit issued) through the date the new equipment actually starts operations. For the netting analysis for this project, the date to begin construction (i.e. permit issued) was estimated to be by December 1, 2005. The new PH/PC kiln system is expected to begin operation by September 2008. Therefore, the contemporaneous period for this netting review was determined to be from December 2000 through September 2008.

EPA has expressed concern that the emissions reductions from Project No. 2001-11-077 may fall out of the contemporaneous period before construction on the new kiln begins. EPA guidance states that for netting purposes the date that the reduction first occurred, in this case February 2, 2003, rather than when the reduction was made federally enforceable (November 2001), should be used for netting analyses. River Cement is also required to begin a continuous program of actual on-site construction of the source or must enter into binding agreements of a substantial nature with regard to construction of the new kiln prior to June 2007 (within 18 months of the effective date of the permit) to avoid possible revocation of the permit. The 18-month window is much more restrictive than the window for the emission reductions from Project No. 2001-11-077 to remain creditable. Should the commencement of construction date not be met, or should other changes at the installation be made during the contemporaneous period, River Cement will be required to undergo review of a revised netting analysis.

Net Emissions Increase Analysis for PM_{10}

The potential emissions from the new equipment added under this permit were included as an emissions increase for this netting analysis. In addition, as this project involves an increase in the maximum clinker production capacity of the installation, there is an increased utilization associated with most of the existing equipment at the installation that must also be included in the netting analysis. The difference in PM_{10} emissions (actual to limited PTE comparison) resulting from this increased utilization of existing equipment was considered to be a creditable emission increase for the netting analysis. The limited potential was based upon a maximum clinker production of 2,220,000 tons annually.

To avoid major review of the project, the installation proposed removal of several pieces of equipment, as well as increased control of select pieces of existing equipment. Revisions to the original netting analysis application were received April 4, 2005 and again on June 22, 2005 incorporating the changes. Special conditions are incorporated in this permit to insure that some pieces of existing equipment are removed from the installation and modifications made to some existing controls to increase efficiency are completed on other pieces of existing equipment.

A review of the permitting projects during the contemporaneous period at this installation identified two (2) additional projects incurring PM_{10} emissions increases. The first project involved the replacement of four (4) existing air separators in the Finish Mill Number 1 and Finish Mill Number 2 with two (2) air separators of a slightly larger capacity (6-F-04B and 6-F-05, Project Number 2001-11-077). During the original review for Permit Number 052002-013, a PM_{10} netting analysis was conducted for this air separator replacement that demonstrated the project would not exceed the significant level of 15 tons per year of PM_{10}. This netting analysis contains a change in the MHDR of 6-F-04B. Although originally permitted at 102 tons of cement per hour, the air separator has been examined by Buzzi Unicem and found to have a potential throughput of 97.0 tons of cement per hour. A special condition is included in this permit concerning the change in design rate.

The second project included the construction of two (2) fuel silos (8-B-10 and 8-B-11) associated with an indirect-fired solid fuel mill/feed system (8-B-12) to replace the direct-fired solid fuel systems (Project Number 2003-05-118). That project resulted in an increase of five percent (5%) in the maximum clinker production capacity of the installation. A PM_{10} netting analysis was also conducted for this project that showed the net emissions increase would be de minimis. The Fuel Mill System Replacement (Project Number 2003-05-118) is currently underway and the Finish Mill System Modification (Project Number 2001-11-077) has not had two (2) years of representative emissions thus, potential emission increases were used to determine the net emissions increase from both of these projects. Net emissions decreases were based on two-year representative average actual emissions.

The permit application contained a third project in its netting analysis. The decrease in emissions caused by the installation of a new baghouse on the tripper discharge into the raw feed bins (2-R-12) was determined to fall outside of the contemporaneous period. Therefore, the net emissions decrease from that project were determined not to be creditable.

During the course of the netting analysis, it was determined that 2-R-04B and 2-R-04D (now combined as 2-R-04) was incorrectly listed as having no control. In fact, the screen has been controlled by a baghouse since it was initially installed. Therefore, in this netting analysis, a baghouse control efficiency of 89.48% has been assigned to this emissions source.

Additionally, the netting analysis was conducted assuming that all gypsum was imported into the plant. Buzzi Unicem intends on manufacturing 60,000 tons per year of synthetic gypsum. However, potential emissions occurring from the handling and conveying of imported gypsum provided the worst case scenario for the netting analysis.

The netting analysis necessarily has to include both the condensable and filterable fractions of PM_{10} from combustion sources. Since the installation has never tested the existing kilns for condensable PM_{10}, special conditions are included as part of this permit so that actual emissions may be included as part of the netting analysis. Furthermore, since condensable PM_{10} tests have never been conducted for the existing kiln system, estimated amounts needed to be used for the netting analysis. Based on information submitted by the applicant, the condensable fraction of PM_{10} emissions is assumed to be eight (8) times the filterable fraction for both the existing and new kiln systems. Buzzi Unicem will be required to submit an analysis detailing the testing conducted on both the existing and new kiln systems to verify that the netting analysis remains valid after use of stack test results.

An extensive review of all the permitting projects submitted by the installation during the contemporaneous period did not identify any other emission units, besides those indicated above, involving any increases or decreases in PM_{10} emissions. Installation of the new kiln system and supporting equipment, modifications to existing equipment, removal of several pieces of existing equipment, increased utilization from existing equipment and the permitting of the two (2) contemporaneous projects caused a net emissions decrease in PM_{10} emissions of 698.67 tons per year. Since the results of this net PM_{10} emissions increase analysis is below the 15 ton per year significant level, this project was reviewed in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required* for PM_{10}. The results of this net emission increase analysis for PM_{10} are provided in Appendix B.

Net Emissions Increase Analysis for SO_x

The same method of analysis as was used in the PM_{10} analysis was employed in determining the net emissions increase analysis for SO_x. Some of the emission units identified during the PM_{10} analysis are also emitters of SO_x. Therefore, the same emission units' emission increases and decreases were examined here.

Removal of the existing kilns (4-K-02) and the elimination of fuel combustion, particularly coke combustion, in the raw mill fluid bed furnaces (8-B-09) account for the decreases in SO_x emissions during the contemporaneous period. Increases come from the new PH/PC system (4-K-09) and from the combustion of natural gas in the Finish Mill #3 Furnace (6-F-19). The remaining increases came from the increased utilization of existing equipment at the installation. The SO_x emissions increase analysis yielded a decrease in emissions of 59.58 tons per year, causing this project to be reviewed in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required* for SO_x.

Net Emissions Increase Analysis for NO_X

The netting analysis for NO_X incurred creditable decreases and increases from the same emission units as the SO_x analyses. Removal of the existing kilns (4-K-02), which are huge emitters of NO_X, and the elimination of fuel combustion in the raw mill fluid bed furnaces (8-B-09) account for the decreases in NO_X emissions during the contemporaneous period. Increases come from the new PH/PC system (4-K-09) and from the combustion of natural gas in the Finish Mill #3 Furnace (6-F-19). The remaining increases came from the increased utilization of existing equipment at the installation. A substantial decrease in emissions of 1,977.31 tons per year was incurred by completing the NO_X emissions increase analysis, causing this project to be reviewed in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required* for NO_X.

Net Emissions Increase Analysis for VOC

In addition to the sources that also contribute SO_x and NO_X emissions, VOC emissions were considered from working and breathing losses from numerous storage tanks at the installation. Both gasoline and diesel storage tanks are being replaced, and new kerosene tanks are being added. The increased utilization of the existing storage tanks and volatile degreasers are contributing sources of emissions, leading to a final net emissions increase of 28.84 tons of VOC per year, less than the significance threshold of 40 tons per year. Therefore, this project was reviewed in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required* for VOC.

Net Emissions Increase Analysis for CO

Again, the same emission units that caused changes in the SO_x and NO_X emissions caused changes in CO emissions. The final netting analysis determined that the net CO emission increase for the project would be 2,129.83 tons per year, since the new kiln system emits a much larger quantity of CO than the removed kilns did. This review was conducted in accordance with Section (8) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required* since potential emissions of CO from the project are above de minimis levels (100 tons per year).

Net Emissions Increase Analysis for Be

The same sources that emit SO_x, NO_X, and CO also are emitters of Be. Creditable increases and decreases were summed, and the net emissions increase for Be was determined to be 2.88E-4 tons per year, causing this project to be reviewed in accordance with Section (5) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required* for Be.

The results of the net emission increase analysis for SO_x, NO_X, VOC, CO and Be are provided in Appendix B.

EMISSIONS/CONTROLS EVALUATION

PM_{10}, SO_2, NO_X and CO are the primary emissions in the manufacture of Portland cement. Small quantities of VOC, ammonia, chlorine and hydrogen chloride also may be emitted. Emissions may also include residual materials from the fuel and raw materials or products of incomplete combustion that are considered to be hazardous. Also, raw material feeds and fuels typically contain trace amounts of heavy metals that may be emitted as PM or vapor.

Sources of PM_{10} at cement plants include (1) quarrying and crushing, (2) raw material storage, (3) grinding and blending, (4) clinker production, (5) finish grinding, and (6) packaging and loading. Additional sources of PM_{10} are raw material storage piles, conveyors, storage silos and unloading facilities. The kiln is a combustion source; PM_{10} from the kiln consists of both a filterable and a condensable fraction. References to PM10 in this permit are assumed to include the condensable fraction, unless specifically listed as filterable PM_{10}. The PM_{10} emission factors and control efficiencies used in this analysis were obtained from the following sections of the EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

Section 11.19.2	*Crushed Stone Processing Operations* (1/95),
Section 11.19.2	*Crushed Stone Processing and Pulverized Minerals Processing* (8/04),
Section 11.6	*Portland Cement Manufacturing* (1/95),
Section 11.12	*Concrete Batching* (11/03),
Section 13.2.2	*Unpaved Roads* (12/03),
Section 13.2.4	*Aggregate Handling and Storage Piles* (1/95), and
Section 1.4	*Natural Gas Combustion* (7/98).

The wind erosion PM_{10} emission factor is from current APCP guidance on storage piles. The PM_{10} emission factor for vehicular activity around the storage pile was obtained from the Noyes Data Corp. book, Orlemann, et al.1983, *Fugitive Dust Control*. Emission factors for the crushing and screening of clay, ore transfer, sand transfer and screening, cement loadout and transfer, coal unloading and crushing, and gypsum conveying were obtained from the EPA Factor Information Retrieval (FIRE) Version 6.23 (SCC Codes: 3-05-009-04, 3-03-023-04, 3-05-025-03, 3-05-025-11, 3-05-006-19, 3-05-006-12, 3-03-003-05, 3-05-010-10, and 3-05-015-04). Emission factors for the existing cement kilns came from stack tests approved by the Air Pollution Control Program conducted by the installation in 1996.

All new emission points controlled by new baghouses are assumed to operate with a PM_{10} outlet grain loading of 0.0085 gr/ACF, but for the new kiln system (4-K-09) and the finish mill #3 (6-F-16). Special conditions are included in this permit to verify the maximum outlet grain loading will not be exceeded. Additional special conditions limit emissions from the kiln system (4-K-09) and the finish mill #3 (6-F-16) in terms of pounds of total PM_{10} per ton of product. Finally, there are a certain number of existing baghouses that will be modified to achieve 99% control efficiency; the permit contains special conditions related to the modifications.

Other changes in operation include the use of the primary crusher (1-Q-10) and secondary crusher (2-R-03B) strictly for limestone after installation of the new system except for in emergency situations, rather than for regular processing of limestone and clay, as they are currently being used. The haul road (1-Q-11B) had been increased in length by 0.5 miles to accommodate travel to the sand crushing processes. To calculate the worst-case scenario for PM_{10} emissions, emissions calculations for gypsum processing assumed that all gypsum would be imported, rather than produced synthetically at the installation.

Oxides of nitrogen are generated during fuel combustion by oxidation of chemically bound nitrogen in the fuel and by thermal fixation of nitrogen in the combustion air. SO_2 may be generated both from the sulfur compounds in the raw materials and from sulfur in the fuel. If the combustion reactions do not reach completion, CO and VOC can be emitted. Incomplete combustion also can lead to emissions of specific HAPs.

Emission factors for SO_x, NO_X, CO and VOC for the new kiln system are engineering estimates from Buzzi Unicem. Emission factors for the remaining pollutants are from the Portland cement section of AP-42 for both the kiln and the finish mill. The breathing/working loss of VOC emission factors for the gasoline, diesel and kerosene storage tanks were obtained from the EPA FIRE Version 6.21 (SCC Codes: 4-03-010-03, 4-03-010-09, 4-03-010-19, 4-03-010-21, 4-03-010-16 and 4-03-010-18, respectively). As previously mentioned, emission factors for the combustion of natural gas in the Finish Mill #3 Furnace were taken from AP-42 Section 1.4, *Natural Gas Combustion*.

Potential emissions for the existing installation were calculated based on information submitted in the 1997 Emissions Inventory Questionnaire (EIQ) and do not include any increases or decreases in emissions from more recent permits. Existing actual emissions decreases were calculated using the average actual emissions from the applicant's 2000 and 2003 EIQ submittals. Potential emissions of the application represent the potential of the new equipment, and increased utilization of existing equipment, assuming a production limit of 2,220,000 tons of clinker annually. The Net Emissions Increase from Project includes all emissions increases and decreases incurred during the contemporaneous period. The following table provides an emissions summary for this project.

Table 3: Emissions Summary (tons per year)

Pollutant	Regulatory *De Minimis* Levels	Existing Potential Emissions	Actual Emissions Decreases of the Project	Potential Emissions Increases of the Project	Net Emissions Increase from Project
PM_{10}	15.0	13,374.50	-2999.5	2300.83	-698.67
SOx	40.0	1,133.50	-595.25	535.67	-59.58
NOx	40.0	6,564.38	-5327.50	3,350.19	-1,977.31
VOC	40.0	28,793.74	-220.70	249.54	28.84
CO	100.0	1,082.24	-911.12	3,040.94	2,129.83
Pb	0.6	N/D	N/A	0.18	N/A
Hg	0.1	N/D	N/A	0.03	N/A
Be	0.0004	N/D	-4.46E-4	7.34E-4	2.88E-4
Fluorides	3.0	N/D	N/A	1.00	N/A

Benzene	10.0	N/D	N/A	17.76	Subpart LLL
Hydrogen Chloride	10.0	N/D	N/A	155.40	Subpart LLL
HAPs	25.0	N/D	N/A	184.62	Subpart LLL

*N/A = Not Applicable; N/D = Not Determined

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (8) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of CO are above the major threshold.

APPLICABLE REQUIREMENTS

Buzzi Unicem shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information,* 10 CSR 10-6.110
  The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required April 1 for the previous year's emissions.

- *Operating Permits*, 10 CSR 10-6.065

- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170

- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220

- *Control of Odors in the Ambient Air*, 10 CSR 10-5.160

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400

- *New Source Performance Regulations*, 10 CSR 10-6.070 – *NSPS for Nonmetallic Mineral Processing Plants*, 40 CFR Part 60, Subpart OOO

- *New Source Performance Regulations*, 10 CSR 10-6.070 – *NSPS for Coal Preparation Plants*, 40 CFR Part 60, Subpart Y

- *Maximum Achievable Control Technology (MACT) Regulations*, 10 CSR 10-6.075, *National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry,* 40 CFR Part 63, Subpart LLL

BACT ANALYSIS

Introduction

Any source subject to Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, Section (8) must conduct a Best Available Control Technology (BACT) analysis on any pollutant emitted in greater than de minimis levels. The BACT requirement is detailed in Section 165(a)(4) of the Clean Air Act, at 40 CFR 52.21 and 10 CSR 10-0.60(8)(B).

A BACT analysis is done on a case by case basis and is performed using a "top-down" method. The following steps detail the top-down approach:

1. Identify all potential control technologies – must be a comprehensive list, it may include technology employed outside the United States and must include the Lowest Achievable Emission Rate (LAER) determinations.
2. Eliminate technically infeasible options – must be well documented and must preclude the successful use of the control option.
3. Rank remaining control technologies – based on control effectiveness, expected emission rate, expected emission reduction, energy impacts, environmental impacts, and economic impacts.
4. Evaluate the most effective controls – based on case by case consideration of energy, environmental, and economic impacts.
5. Select BACT.

The new PH/PC kiln system and the new finish mill being permitted by Buzzi Unicem are subject to BACT analysis for CO emissions, which exceed the significant threshold of 100.0 tons per year. Buzzi Unicem prepared a BACT analysis based on the U.S. EPA RACT/BACT/LAER Clearinghouse (RBLC) database, vendor information, and permit applications for kiln systems issued in the State of Missouri and elsewhere. The BACT analysis is summarized below.

CO Control Technologies for PH/PC Kiln

The following BACT options were evaluated:

- Process Optimization – Good Combustion Practices
- Thermal Oxidation
- Selective Mining/Raw Material Substitution
- Catalytic Oxidation

Process Optimization – Good Combustion Practices

Good combustion practices (process controls) are commonly employed methods of regulating the process to optimize fuel efficiency and to limit products of incomplete combustion. The proper amount of oxygen assures that complete combustion occurs associated with the complete conversion of CO to carbon dioxide (CO_2) from the process. Use of process optimization as a CO control technology is considered both demonstrated and it is technically feasible.

Thermal Oxidation
Thermal oxidation is performed with devices that use an open flame or combustion within an enclosed chamber to oxidize pollutants. Thermal oxidizers typically operate at temperatures that range from 1,200 ^{o}F to 2,000 ^{o}F, with a residence time of up to two (2) seconds.

The three types of thermal oxidizers that are most commonly used in industrial plants are:
- Regenerative (RTO)
- Recuperative
- Open-flame (Flare)

The most energy efficient of these three types is the RTO. The RTO can theoretically recover up to 98% of the heat used during oxidation under ideal conditions. In the routine operation of a Portland cement plant, it is estimated that a maximum of 75% heat recovery rate over the operating life of the RTO can be expected. Typical gas stream characteristics of effluent emitted from a PH/PC kiln system contain PM that can render the RTO prone to fouling of the heat transfer media. The maximum of a 75% heat recovery rate is attributable to anticipated fouling of the heat transfer media in the RTO. Use of RTO is considered to be technically feasible.

Recuperative systems incorporate primary and sometimes secondary heat exchangers. The primary heat exchangers are used to preheat the air stream before it enters the combustion chamber. The recuperative systems do recover heat, but not as efficiently as a regenerative system. Secondary heat exchangers return heat to the building or are used for other purposes in the plant. The open flame (flare) technology is the least energy efficient thermal oxidizer since it does not recover any heat. Since both the recuperative and open-flame systems are less energy efficient without providing additional control of CO, only RTO will be considered further.

Catalytic Oxidation
Catalytic oxidation is the oxidation of CO in the presence of a catalyst, typically platinum, which allows oxidation to proceed at lower temperatures than those required for thermal oxidation. A catalytic oxidizer usually operates effectively between temperatures of 600 ^{o}F to 900 ^{o}F.

The lower oxidation temperature allows for potential supplemental fuel savings using a catalytic oxidizer compared to a thermal oxidizer. However, since the catalyst required for the catalytic oxidation technology is significantly more expensive than the thermal oxidation catalyst, the potential fuel savings are offset by the capital costs required to obtain the more expensive catalyst material. Similar to the thermal oxidizer, the catalytic oxidizer uses supplemental fuel, such as natural gas, to maintain the proper oxidation temperature.

According to technical sources, catalytic oxidation is prone to catalyst “poisoning”. Poisoning occurs when certain chemical poisons such as mercury, lead and cadmium are contained in the gas stream as PM. When the platinum catalyst is exposed to these chemicals, inactive alloys are formed which reduces the effectiveness of the catalyst. Due to the poisoning effect of PM emissions, the use of catalytic oxidation as an add-on CO control device is not considered technically feasible as BACT for CO.

Selective Mining/Raw Material Substitution
Selective mining causes a decrease in emissions of CO caused by the incomplete combustion of VOC-containing components in the raw material. The most common approach to selective mining at cement plant quarries is to eliminate, to the maximum extent possible, the use of the shale layer, high in VOC content, that lies above the limestone.

There are potentially several different sources of raw materials available that can provide the ingredients necessary to produce a quality product. Calcium is the chemical element of highest concentration contained in Portland cement and is potentially found in limestone, chalk, marl, aragonite, and cement rock. Silica, aluminum and iron are the next most prevalent chemical elements contained in Portland cement. Examples of raw material sources of these elements include quarried/mined sand, foundry sand, shale, clays, iron ore, mill scale, iron slag, fly ash, and bottom ash.

<u>Ranking of Remaining Control Technologies by Control Effectiveness</u>

Table 4: Ranking of CO Control Technologies by Effectiveness

Control Technology	CO Control Efficiency (%)
Regenerative Thermal Oxidation	98%
Process Optimization – Good Combustion Practices	95%
Raw Material Substitution and Selective Quarrying	46%

<u>Evaluation of Most Effective CO Controls</u>

Regenerative Thermal Oxidation
Buzzi Unicem believes that use of a stand alone RTO system will likely result in significant oxidation of SO_2 to sulfur trioxide (SO_3). The SO_3 emissions that would exit the new kiln stack will have the potential to react with other stack gas constituents and produce elevated opacity in a “detached plume” effect. In order to eliminate this potential opacity problem, the additional installation of a wet lime scrubber (WLS) would be required to decrease the SO_2 concentration entering the RTO. The WLS needs to be located upstream of the RTO in order to provide additional PM control to reduce fouling of the heat transfer media and to decrease the SO_2 concentration entering the RTO.

The kiln exit gas stream would have to be reheated from 135^o F to 1,800^o F for the system to operate properly. Natural gas would be used to reheat the exit gas stream. Since a significant amount of natural gas is required for reheat, the RTO would produce a significant amount of NO_X emissions, resulting in a substantial negative environmental impact since Buzzi Unicem is located in a St. Louis ozone area. Operation of the RTO system would also require a significant amount of electricity to be used. The generation of the RTO system electricity demand would result in additional air pollution being generated.

The RTO system also presents substantial economic feasibility issues. An economic feasibility analysis was performed for the combined WLS and RTO system. An approximate total of 2,967 tons per year of CO would be removed through the installation and operation of a combined WLS and RTO system at a total cost of approximately $6,600,000. The calculated cost effectiveness of a RTO system is estimated to be $2.95 per ton of clinker produced. Increasing the cost of producing clinker by that sum would place the installation at a severe economic disadvantage and cause the project to be considered economically infeasible. The use of an RTO system is excluded from consideration due to expected substantial negative environmental impacts and economic infeasibility.

Process Optimization – Good Combustion Practices
There are no additional costs attributed to process optimization. Complete combustion is accomplished through careful monitoring and adjustment of fuel rates and combustion air. Process optimization will lead to lower production costs, optimization of fuel resources, and optimal combustion efficiency.

River Cement researched other kilns and the resultant BACT limits for each unit using good combustion practices. Achievement of the 2.73 pounds of CO per ton of clinker limit is less than half of the limit recently accepted for the Holcim kiln at Lee Island in Missouri. The few kilns with lower emission limits than the proposed limit for River Cement are distinctly different than the type of process that will be constructed in Festus. The Rio Grande Portland Cement Corporation has a BACT limit of 2.11 pounds of CO per ton of clinker however, the installation combusts crude instead of coal and is capable of producing less than one-half of the clinker (only 950,000 tons of clinker annually) as the proposed kiln. Two kilns in Florida were examined. Florida Rock Industries has a BACT limit for CO of 2.5 pounds per ton of clinker, but is able to operate at an hourly production rate of 115 tons per hour of clinker production, one-third of the rate of the proposed kiln. Florida Crushed Stone had a BACT limit of 2 pounds of CO per ton of clinker for a preheater kiln however, the kiln was never built, possibly due an unachievable CO limit. In its latest iteration, Florida Crushed Stone (now owned by Rinker) was permitted earlier this year with a CO limit of 3.6 pounds per ton. The limit proposed by Buzzi in its permit application is found to be the lowest of permitted kilns in the nation without limitations on raw materials.

Selective Mining/Raw Material Substitution
The implementation of selective mining would require the conduct of extensive expulsion testing throughout the quarry in order to identify areas of elevated hydrocarbon content. Once identified, the excavation and removal of the elevated hydrocarbon material would need to be performed. Since significant vertical and lateral

variability of hydrocarbons typically occur within a geologic deposit, effective mitigation of organic compounds is not likely. The calculated cost effectiveness of using selective mining for CO BACT is estimated to be $4.27 per ton of clinker produced. It is concluded that use of selective mining for the control of CO emissions as BACT is economically infeasible.

The ready availability of cost-effective sources of raw materials required to meet the expected demands is a critical consideration in the design of a new kiln system intended for expansion at an existing facility. However, the scope of viable raw material candidates is limited by the extremely exacting requirements of raw mix chemistry. Substitution of the limestone source, iron source, silica source and red clay source were all determined to be economically infeasible.

Selection of BACT CO Control Technology for the PH/PC Kiln
The only remaining control technology is process optimization. Buzzi Unicem will use good combustion practices to control CO emissions, with an annual CO BACT limit of 2.73 pounds per short ton of clinker produced.

CO Control Technologies for Finish Mill System
The following BACT option was evaluated:
- Clean Fuel/Good Combustion Practice

Good combustion practice is commonly employed to maximize fuel efficiency and to minimize the generation of products of incomplete combustion. This is typically achieved by assuring sufficient oxygen is available for the quantity of fuel being delivered to the system, resulting in the maximum conversion of CO to carbon dioxide from the combustion process. Natural gas is inherently considered a clean fuel. Use of good combustion practice as a CO control technology is considered both available technically feasible.

Selection of BACT CO Control Technology for the Finish Mill System
Good combustion practice is chosen as CO BACT for the finish mill system. The continued use of good combustion practices will be ensured by establishing an Operating and Maintenance Manual based on manufacturer's specifications and recommendations, and by providing system operators with training on those procedures. Good combustion practices are expected to include the following practices:

- Equipment operation:
  - ♦ Practices relating to maintaining the appropriate stoichiometric ratio between fuel and air, such as burner and control adjustment based on direct and/or indirect (camera) visual checks, burner and control adjustment based on continuous or periodic monitoring of O2 and CO, and automatic safety interlocks;
  - ♦ Practices relating to insuring the appropriate quality of fuels, such as fuel quality certification from suppliers, fuel sizing specifications and checks, periodic fuel sampling and analysis;
  - ♦ Practices relating to maintaining the appropriate combustion air distribution and fuel dispersion, such as adjustments based on direct and/or indirect visual

observations.

- Operator Practices:
  - ♦ Practices relating to insuring that adequate and consistent combustion procedures are in use, such as official documented operating procedures (updated as required for equipment or practice change), procedures for all phases of combustion including startup, shutdown, malfunction, the compilation and maintenance of operating logs;

- Maintenance Practices:
  - ♦ Practices relating to maintaining the combustion equipment and the combustion monitoring and control equipment in good working order, such as the preparation of official documented maintenance procedures, updated as required for equipment or practice change, the performance of routinely scheduled evaluation, inspection, overhaul as appropriate for equipment involved, and the compilation and maintenance of logs recording compliance with all required procedures.

AMBIENT AIR QUALITY IMPACT ANALYSIS

An ambient air quality impact analysis (AAQIA) was performed to determine the impact of CO emissions at or beyond the “core plant” property boundary used in the modeling analysis of the proposed Buzzi Unicem installation. The declared area, using Universal Transverse Mercator (UTM) Zone 15, North American Datum (NAD) 27, is: Southwest corner – 733000, 4228900; Northwest corner – 733000, 4229400; Northeast corner – 733800, 4229400 and Southeast corner – 733800, 4228900. The “core plant” is mostly surrounded by a gated fence, which is manned by a security guard, or locked during his absence. Two (2) areas are unfenced: the first is an area that provides a 100-foot bluff to preclude access; the second is along the Mississippi riverfront. In addition to the security guard at the gated entrance, shift foreman are provided training specifically on their responsibility to be watchful for the presence of unauthorized persons on site during the course of their inspection rounds.

The AAQIA must be completed for any air contaminant that exceeds the de minimis emission levels outlined in 10 CSR 10-6.020 (3)(A) Table 1. Due to the net emissions increase analysis conducted by the installation for PM_{10}, SO_x, NO_X, VOC and beryllium, the only air contaminant that exceeds its respective de minimis level is CO.

A preliminary analysis was conducted to determine if the applicant would be required to perform preconstruction monitoring, additional air quality modeling, or if the applicant can forego further analysis altogether. If the preliminary analysis indicates that the facility will not significantly impact the air quality within a region, no further analysis is required. In addition to providing an indication of what pollutants must undergo a full impact analysis, the results of the preliminary analysis determine what, if any, preconstruction monitoring will be required. If the preliminary analysis indicates that the facility will not exceed the monitoring significance level, no preconstruction monitoring is necessary. Table 5 summarizes that no further modeling or preconstruction monitoring is required for CO based on the results of the preliminary analysis.

Table 5: Significance Levels for Modeling and Preconstruction Monitoring (μg/m^3)

Averaging Period	Modeling Significance Level	Preliminary Analysis Results	Monitoring Significance Level	Preliminary Analysis Results
1 – hour	2000	947.44	575	449.97
8 - hour	500	449.97		

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (8), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with special conditions.

______________________________ ____________________

Lina Klein Date
Environmental Engineer

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

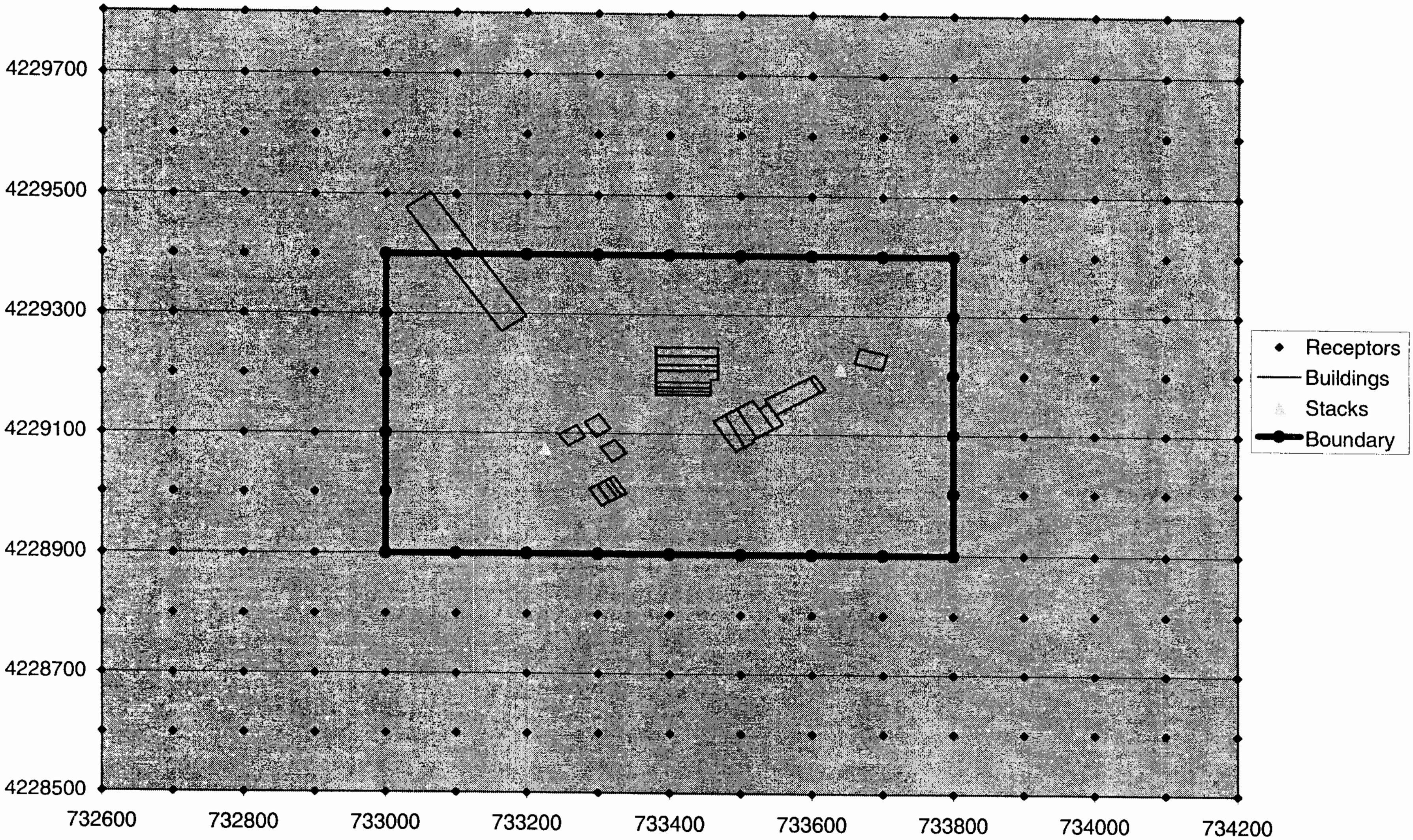
- The Application for Authority to Construct form, dated December 10, 2004, received December 13, 2004, designating Buzzi Unicem USA, Inc. as the owner and operator of the installation.
- Map of Property Boundary and Material Safety Data Sheets, dated December 22, 2005 and received December 27, 2004.
- St. Louis Regional Office Site Survey, dated January 7, 2005.
- Revision of PM_{10} Potential-To-Emit Air Emissions Inventory, PM_{10} Contemporaneous Air Emission Changes, and New Source Review Applicability, dated April 1, 2005 and received April 4, 2005.
- Revision #2 to CO BACT Analysis, dated July 6, 2005 and received July 12, 2005.
- Revision to Application for Authority to Construct, received August 3, 2005.
- Revision #2 to PSD Modeling Memorandum, dated August 22, 2005.
- Revision #2 to Application for Authority to Construct, dated and received September 6, 2005.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.

- Stack test reports provided by the applicant.

Appendix A

River Cement Company, dba Buzzi Unicem USA – Selma Plant
Plant Operation Area

Figure 1: Property Boundary & Building Locations for Buzzi Unicem - River Plant



Appendix B

Net Emissions Increase Analysis

Table B.1
PM10 Netting Analysis Summary

Net Emissions Decreases for Units Removed Under Project No. 2001-11-077		1999	2000	2 Year Avg.	PM10	Units of	PM10	Emissions
Point ID	**DESCRIPTION**	**Thruput**	**Thruput**	**Thruput**	**EmFactor**	**Measure**	**Control %**	**(Tons)**
6-F-04	#1 Finish Mill Air Separators Removed	742,322	725,276	733,799.00	0.0238	Tons	0	-8.7322
6-F-05	#2 Finish Mill Air Separators Removed	663,229	647,850	655,539.50	0.0238	Tons	0	-7.8009
				Net Decrease in PM10 Emissions:				**-16.5331**
Net Emissions Decreases for Units Removed Under Project No. 2003-05-118		**1999**	**2000**	**2 Year Avg.**	**PM10**	**Units of**	**PM10**	**Emissions**
Point ID	**DESCRIPTION**	**Thruput**	**Thruput**	**Thruput**	**EmFactor**	**Measure**	**Control %**	**(Tons)**
8-B-07	Discharge Belts (2623/2634) from Coke Bins (2542/2550)	201,357	197,068	199,212.50	0.000054	Tons Processed	0	-0.0054
8-B-08	Coke Crushers (1407 and 1408)	201,357	197,068	199,212.50	0.006	Tons Coal Shipped	0	-0.5976
				Net Decrease in PM10 Emissions:				**-0.6030**
Net Emission Decreases for Units Removed Under Project No. 2004-12-050		**2003**	**2000**	**2 Year Avg.**	**PM10**	**Units of**	**PM10**	**Emissions**
Point ID	**DESCRIPTION**	**Thruput**	**Thruput**	**Thruput**	**EmFactor**	**Measure**	**Control %**	**(Tons)**
2-R-04A	Screen (1607)	1,442,770.00	1,444,590.00	1,443,680.00	0.01330	Tons Processed	89.48	-1.0100
2-R-04C	Screen 1607 Discharge onto Belts (1703/1744)			0.00				0.0000
2-R-04D	Screen 1601 Discharge onto Belts (1703/1704)			0.00				0.0000
2-R-06	TP: Belt Conveyor (1707) to Belt Conveyor (1701)	70,000.00	30,000.00	50,000.00	0.000048	Tons Handled	89.48	-0.0001
2-R-11	TP:Belt 1703 to Belt Conv&Trip (1710/1732)	2,150,937.00	2,284,500.00	2,217,718.50	0.002635	Tons Handled	0	-2.9218
2-R-12	TP:Trippers Discharge into Raw Feed Bins	2,150,937.00	2,284,500.00	2,217,718.50	0.002635	Tons Handled	0	-2.9218
3-G-01	Raw Mill Bin Feeders to Belts (1711/1712) (3 pts.)	2,909,121.00	3,113,124.00	3,011,122.50	0.002635	Tons Handled	0	-3.9672
3-G-02A	Raw Mill #1 Air Separators (2901/2902)	969,707.00	1,037,708.00	1,003,707.50	0.02720	Tons Material Processed	0	-13.6504
3-G-02B	Air Slide (3204) & Belt Discharge onto Elev. (2803/2804)	1,939,414.00	2,075,416.00	2,007,415.00	0.002635	Tons Handled	0	-2.6448
3-G-03	Scale Belt (1713)	969,707.00	1,037,708.00	1,003,707.50	0.002635	Tons Handled	0	-1.3224
3-G-04	Raw Mill #1 (3101)	969,707.00	1,037,708.00	1,003,707.50	0.01020	Tons Cement Produced	0	-5.1189
3-G-05	Air Slide (3204) Discharge onto Elevators (2803/2804)	969,707.00	1,037,708.00	1,003,707.50	0.002635	Tons Cement Produced	0	-1.3224
3-G-06	TP: Raw Mill Bin Feeders onto Belt 1742 (2 pts.)	2,343,774.00	2,364,416.00	2,354,095.00	0.002635	Tons Handled	0	-3.1015
3-G-07	Raw Mill #2 Air Separator (2907)	1,171,887.00	1,182,208.00	1,177,047.50	0.02720	Tons Material Processed	0	-16.0078
3-G-08	Raw Mill #2 (3104)	1,171,887.00	1,182,208.00	1,177,047.50	0.01020	Tons Cement Produced	0	-6.0029
3-G-09	Separator Air Slide Discharge to F-K Pumps	2,343,774.00	2,364,416.00	2,354,095.00	0.002635	Tons Handled	0	-3.1015
4-K-01	Kiln Feed Alleviators (2512/2544)	2,031,574.00	2,107,851.00	2,069,712.50	0.002635	Tons Handled	0	-2.7268
4-K-02	Cement Kilns (4001/4002)	1,327,826.00	1,377,680.00	1,352,753.00	0.44631	Tons Cement Produced	0	-301.8736
4-K-02	Cement Kilns (4001/4002) - condensable PM10 fraction	1,327,826.00	1,377,680.00	1,352,753.00	3.57048	Tons Cement Produced	0	-2414.9888
4-K-02A	Cement Kilns – Coke Combustion	202,086.00	197,068.00	199,577.00	0.00000	Tons Burned	0	0.0000
4-K-02B	Cement Kilns – Waste Supplemental Fuel Combustion			0.00				0.0000
4-K-02C	Cement Kilns – Nat. Gas Combustion	72,359.00	75,972.00	74,165.50	0.00000	MMCF Burned	0	0.0000
4-K-02D	Cement Kiln – Coal Combustion	0.00	0.00	0.00	0.00000	Mgal Burned	0	0.0000
4-K-03	East CKD Tank	105,525.00	110,037.00	107,781.00	0.20000	Tons Cement Produced	86.77	-1.4259
4-K-04	Waste Dust Truck Load Spout	7,880.00	0.00	3,940.00	0.20000	Tons Cement Produced	86.77	-0.0521
4-K-05	Waste Dust Storage Tank	97,645.00	110,037.00	103,841.00	0.20000	Tons Cement Produced	89.48	-1.0924
4-K-06	Waste Dust Pelletizer	97,645.00	110,037.00	103,841.00	0.20000	Tons Cement Produced	34.23	-6.8296
4-K-07	Waste Dust Pile - Wind Erosion	97,645.00	110,037.00	103,841.00	0.25035	Tons Product Stored	0	-12.9983
4-K-07	Waste Dust Pile - Vehicle Activity	97,645.00	110,037.00	103,841.00	0.05787	Tons Product Stored	0	-3.0046
4-K-07	Waste Dust Pile - Load Out Only	97,645.00	110,037.00	103,841.00	0.00029	Tons Product Stored	0	-0.0151
4-K-07A	Waste Dust Pile Unpaved Haul Road	1,775.36	2,000.67	1,888.02	3.70053	Vehicle-Miles	50	-1.7467
4-K-07B	Waste Dust Transfer Point	97,645.00	110,037.00	103,841.00	0.15000	Tons Handled	0	-7.7881
4-K-08	R.C.G.A. Tank	4,586.00	8,926.00	6,756.00	0.20000	Tons Cement Produced	89.48	-0.0711
5-L-01	Clinker Coolers (4101/4104)	1,327,826.00	1,377,680.00	1,352,753.00	0.12620	Tons Cement Produced	0	-85.3587
5-L-02	Clinker Conveyors (3 transfer points)	1,327,826.00	1,377,680.00	1,352,753.00	0.00204	Tons Cement Produced	0	-1.3798
5-L-03A	TP: Clinker from Conveyor to Elevators (2807/2808)	1,327,826.00	1,377,680.00	1,352,753.00	0.00204	Tons Cement Produced	0	-1.3798
5-L-04	TP: Clinker from Elev. (2807/2808) to Elev. (2810-2811)	1,327,826.00	1,377,680.00	1,352,753.00	0.00204	Tons Cement Produced	0	-1.3798
5-L-07A	TP: Clinker from Belt (1716) to Belt (1714)	127,159.00	96,675.00	111,917.00	0.00204	Tons Cement Produced	0	-0.1142
8-B-01	Coke Barge Unloading/Truck Loading	214,683.00	181,522.00	198,102.50	0.000054	Tons Processed	0	-0.00053
8-B-02	Haul Road: Coke from Barge Unloading to Stockpile	4,293.66	3,630.44	3,962.05	2.00448	Vehicle-Miles	50	-1.9855
8-B-06B	TP: Coke/Coal Belt (1730) - Furnace Storage Tank	15,512.00	15,753.00	15,632.50	0.000054	Tons Processed	0	-0.0004
8-B-09A	Raw Mill Fluid Bed Furnaces – Coke Combustion			0.00				0.0000
8-B-09AC	Raw Mill Fluid Bed Furnace 1 – Coal Combustion	0.00	0.00	0.00	13.20000	Tons Burned	89.24	0.0000
8-B-09AK	Raw Mill Fluid Bed Furnace 1 – Coke Combustion	6,950.00	7,408.00	7,179.00	13.20000	Tons Burned	89.24	-5.0982
8-B-09AN	Raw Mill Fluid Bed Furnaces – Nat. Gas Combustion	9.64	2.63	6.14	7.60000	MMCF Burned	89.24	-0.0025

Table B.1

PM10 Netting Analysis Summary

8-B-09BC	Raw Mill Fluid Bed Furnaces – Coal Combustion	0.00	0.00	0.00	13.20000	Tons Burned	89.24	0.0000
8-B-09BK	Raw Mill Fluid Bed Furnace 2 – Coke Combustion	8,562.00	8,345.00	8,453.50	13.20000	Tons Burned	89.24	-6.0033
8-B-09BN	Raw Mill Fluid Bed Furnace 2 – Nat. Gas Combustion	3.86	0.66	2.26	7.60000	MMCF Burned	89.24	-0.0009
				Net Decrease in PM10 Emissions:				**-2920.4153**
Net Emissions Decreases for Units Modified Under Project No. 2004-12-050		**2003**	**2000**	**2 Year Avg.**	**PM10**	**Units of**	**PM10**	**Emissions**
Point ID	**DESCRIPTION**	**Thruput**	**Thruput**	**Thruput**	**EmFactor**	**Measure**	**Control %**	**(Tons)**
1-Q-10	Primary Crusher Used only for limestone, instead of plus clay	2,061,100.00	2,063,700.00	2,062,400.00	0.01301	Tons Processed	0	-13.4190
2-R-03B	Secondary Crushers used only for limestone, instead of plus clay	2,885,540.00	2,889,180.00	2,887,360.00	0.01301	Tons Processed	89.48	-1.9764
6-F-06	F-K Pump (Finish Mills 1 & 2) - old baghouse	1,351,264	1,373,126	1,362,195.00	0.2	Tons Cement Produced	89.24	-14.6572
7-C-01	Cement Storage Silos - old baghouse	1,351,264	1,373,126	1,362,195.00	0.2	Tons Cement Produced	89.48	-14.3303
7-C-02	Cement Pump Feed Bins - old baghouse	1,136,706	1,090,282	1,113,494.00	0.2	Tons Cement Produced	89.48	-11.7140
7-C-06	TO: Cement from belt 1719 to belt 1720 - old baghouse	81,968	103,932	92,950.00	0.2	Tons Cement Produced	89.48	-0.9778
7-C-04	FILLING OF CEMENT STORAGE DOME	54,666.00	141,563.00	98,114.50	0.2	Tons Cement Produced	89.48	-1.0322
7-C-05	TP:CEMENT STORAGE DOME LOADOUT:FEEDERS-BELT 1719	81,968.00	103,932.00	92,950.00	0.2	Tons Cement Produced	89.48	-0.9778
7-C-08	TRUCK LOADING SPOUT	315,158.00	230,004.00	272,581.00	0.2	Tons Cement Produced	89.48	-2.8676
				Net Decrease in PM10 Emissions:				**-61.9522**
				Total Net Emissions Decreases for Netting Analysis:				**-2999.5036**
Net Emission Increases for Equipment Added under Project No. 2001-11-077								
Point ID	**DESCRIPTION**			**MHDR**	**EmFactor**	**Measure**	**Control %**	**(Tons)**
6-F-04B	#1 Finish Mill Air Separators Replacement			97.00	0.02380	Tons	0	10.1117
6-F-05	#2 Finish Mill Air Separators Replacement			102.00	0.02380	Tons	0	10.6329
				Net Increase in PM10 Emissions:				**20.7446**
Net Emission Increases for Equipment Added under Project No. 2003-05-118								
Point ID	**DESCRIPTION**			**MHDR**	**EmFactor**	**Measure**	**Control %**	**(Tons)**
8-B-10	North Solid Fuel Silo			35.00	0.00005	Tons Handled	99	0.00008
8-B-11	South Solid Fuel Silo			35.00	0.00005	Tons Handled	99	0.00008
8-B-12	Coal Mill System			35.00	0.00600	Tons Processed	99	0.0092
--	5% Increase in Clinker Capacity over Avg. 1999-2000 Levels			--	--	--	--	38.1790
				Net Increase in PM10 Emissions:				**38.1884**
Net Emission Increases for Equipment Modified under this Project No. 2004-12-050				**Potential Annual**				
Point ID	**DESCRIPTION**			**Throughput**	**EmFactor**	**Measure**	**Control %**	**(Tons)**
1-Q-10	PRIMARY CRUSHER(1401)			4,200,000	0.00054	Tons Processed	0.00	1.1340
2-R-03B	SECONDARY CRUSHERS(1402/1409)			4,200,000	0.00054	Tons Processed	89.48	0.1193
6-F-06	F-K Pump (Finish Mills 1 & 2) - new baghouse			1,743,240	0.20000	Tons Cement Produced	99	1.7432
7-C-01	Cement Storage Silos - new baghouse			2,436,000	0.20000	Tons Cement Produced	99	2.4360
7-C-02	Cement Pump Feed Bins - new baghouse			2,436,000	0.20000	Tons Cement Produced	99	2.4360
7-C-06	TO: Cement from belt 1719 to belt 1720 - new baghouse			685,745	0.20000	Tons Cement Produced	99	0.6857
7-C-04	FILLING OF CEMENT STORAGE DOME			685,745	0.20000	Tons Cement Produced	99	0.6857
7-C-05	TP:CEMENT STORAGE DOME LOADOUT:FEEDERS-BELT 1719			685,745	0.20000	Tons Cement Produced	99	0.6857
7-C-08	TRUCK LOADING SPOUT			365,400	0.20000	Tons Cement Produced	99	0.3654
				Net Increase in PM10 Emissions:				**10.2912**
Net Emission Increases for Equipment Added under Project No. 2004-12-050			**Potential Annual**	**MHDR (tons/hr)**	**Em Factor (lbs/ton)**			
Point ID	**DESCRIPTION**		**Throughput**	**or (ACFM)**	**or (gr/acf)**	**Measure**	**Control %**	**(Tons)**
1-Q-15	Clay/Correctives Crusher and Conveying		420,000	15,000.0	0.0085	Tons Processed	0.00%	4.79
1-Q-16	Clay Conveying to Raw Mill Feed Bins		420,000	7,500.0	0.0085	Tons Processed	0.00%	2.39
1-Q-17	Sand Crusher & Sand Unloading to Crusher		420,000	12,000.0	0.0085	Tons Processed	0.00%	3.83
1-Q-18	Sand Discharge from Crusher to Conveyor Belt		420,000	12,000.0	0.0085	Tons Processed	0.00%	3.83
2-R-13	Discharge from Belts 1702/1743 and Conveying to Diverter		4,200,000	5,000.0	0.0085	Tons Handled	0.00%	1.60
2-R-14	Raw Material Diverter to Stock Pile or Raw Mill Feed Bins		4,200,000	7,500.0	0.0085	Tons Handled	0.00%	2.39
2-R-15	Conveying to and Discharge into Raw Mill Feed Bin		4,200,000	7,500.0	0.0085	Tons Handled	0.00%	2.39
2-R-16	Discharge into Raw Mill Feed Bins from Clay & Limestone Crushing		4,200,000	7,500.0	0.0085	Tons Handled	0.00%	2.39
2-R-17	Discharge into Raw Mill Feed Bins from Sand Crushing		4,200,000	5,000.0	0.0085	Tons Handled	0.00%	1.60
2-R-18	Enclosed Limestone Stock Pile/Storage Building		4,200,000	15,000.0	0.0085	Tons Product Stored	0.00%	4.79
2-R-19	Weigh Feeder #1 from Limestone Stock Pile		4,200,000	3,000.0	0.0085	Tons Handled	0.00%	0.96
2-R-20	Weigh Feeder #2 from Limestone Stock Pile		4,200,000	3,000.0	0.0085	Tons Handled	0.00%	0.96

Table B.1

PM10 Netting Analysis Summary

2-R-21	Mill Feed Bins Weigh Feeder #1 Discharge to Mill Feed Belt	4,200,000	3,000.0	0.0085	Tons Handled	0.00%	0.96
2-R-22	Mill Feed Bins Weigh Feeder #2 Discharge to Mill Feed Belt	4,200,000	3,000.0	0.0085	Tons Handled	0.00%	0.96
2-R-23	Mill Feed Bins Weigh Feeder #3 Discharge to Mill Feed Belt	4,200,000	3,000.0	0.0085	Tons Handled	0.00%	0.96
2-R-24	Mill Feed Bins Weigh Feeder #4 Discharge to Mill Feed Belt	4,200,000	3,000.0	0.0085	Tons Handled	0.00%	0.96
2-R-25	Mill Feed Bins Weigh Feeder #5 Discharge to Mill Feed Belt	4,200,000	3,000.0	0.0085	Tons Handled	0.00%	0.96
2-R-26	Mill Feed Bins Weigh Feeder #6 Discharge to Mill Feed Belt	4,200,000	3,000.0	0.0085	Tons Handled	0.00%	0.96
3-G-12	Discharge from Mill Feed Belt to Inline Raw Mill	4,200,000	6,000.0	0.0085	Tons Processed	0.00%	1.91
3-G-13	Inline Raw Mill	4,200,000	0.0	0	Tons Processed	0.00%	0.00
3-G-14	Recirculation System from Raw Mill to Cyclones	4,200,000	10,000.0	0.0085	Tons Processed	0.00%	3.19
3-G-15	Raw Mill Cyclones Conveying	4,200,000	10,000.0	0.0085	Tons Processed	0.00%	3.19
3-G-16	Blend Silo Elevator	4,200,000	5,000.0	0.0085	Tons Processed	0.00%	1.60
3-G-17	Conveying to Blending Silos	4,200,000	12,000.0	0.0085	Tons Processed	0.00%	3.83
3-G-18	Kiln Feed Elevator Transfer to Conveyor and Discharge into Kiln Feed Bin	4,200,000	5,000.0	0.0085	Tons Processed	0.00%	1.60
3-G-19	Kiln Feed Bin Discharge to Preheater Elevator	4,200,000	5,000.0	0.0085	Tons Processed	0.00%	1.60
3-G-20	Preheater Elevator Discharge into Preheater	4,200,000	10,000.0	0.0085	Tons Processed	0.00%	3.19
4-K-09	Preheater/Precalciner Kiln – Clinker Cooler System	2,220,000	330.7	0.1925	Tons Clinker Produced	0.00%	213.68
4-K-09	Preheater/Precalciner Kiln – Clinker Cooler System - condensable PM10 fraction	2,220,000	330.7	1.5400	Tons Clinker Produced	0.00%	1709.40
4-K-10	Discharge from Clinker Cooler to Conveyor	2,220,000	10,000.0	0.0085	Tons Clinker Produced	0.00%	3.19
4-K-11	Haul Road (Paved) Calcium Hydroxide Entrance to Bin	94	7.8	2.00448041	Vehicle-Miles	95.00%	0.00
4-K-12	Calcium Hydroxide Tank and Discharge to Preheater	900	0.0	0	Tons Handled	0.00%	0.00
4-K-13	Haul Road (Paved) Ammonia Hydroxide Entrance to Tank	33	2.6	1.45735684	Vehicle-Miles	95.00%	0.00
5-L-11	Clinker Off-Spec Bin Conveying	2,220,000	7,500.0	0.0085	Tons Clinker Handled	0.00%	2.39
5-L-12	Clinker Diverters Discharge to New Clinker Conveyors	2,220,000	7,500.0	0.0085	Tons Clinker Handled	0.00%	2.39
5-L-13	Clinker Discharge to Belts 1716/1714	2,220,000	7,500.0	0.0085	Tons Clinker Handled	0.00%	2.39
5-L-14	Clinker Transfer to Belt 1703	2,220,000	5,000.0	0.0085	Tons Clinker Handled	0.00%	1.60
5-L-15	Belt 1703 to Belt Conv&Trip (1710/1732)(Old 2-R-11)	2,119,920	443.0	0.00204	Tons Clinker Handled	0.00%	2.16
5-L-16	Trippers Discharge into Converted Clinker Silos (old 2-R-12)	2,119,920	443.0	0.00204	Tons Clinker Handled	0.00%	2.16
5-L-17	Clinker Conveying to Converted Clinker Silos	2,119,920	7,500.0	0.0085	Tons Clinker Handled	0.00%	2.39
5-L-18	Clinker Conveying to Converted Clinker Silos	2,119,920	7,500.0	0.0085	Tons Clinker Handled	0.00%	2.39
6-F-07	Clinker & Gypsum Weigh Feeder #1 from Silos to FM Conveyors	2,119,920	3,000.0	0.0085	Tons Cement Produced	0.00%	0.96
6-F-08	Clinker & Gypsum Weigh Feeder #2 from Silos to FM Conveyors	2,119,920	3,000.0	0.0085	Tons Cement Produced	0.00%	0.96
6-F-09	Clinker & Gypsum Weigh Feeder #3 from Silos to FM Conveyors	2,119,920	3,000.0	0.0085	Tons Cement Produced	0.00%	0.96
6-F-10	Clinker & Gypsum Weigh Feeder #4 from Silos to FM Conveyors	2,119,920	3,000.0	0.0085	Tons Cement Produced	0.00%	0.96
6-F-11	Clinker & Gypsum Weigh Feeder #5 from Silos to FM Conveyors	2,119,920	3,000.0	0.0085	Tons Cement Produced	0.00%	0.96
6-F-12	Clinker & Gypsum Weigh Feeder #6 from Silos to FM Conveyors	2,119,920	3,000.0	0.0085	Tons Cement Produced	0.00%	0.96
6-F-13	Clinker & Gypsum Transfer to Conveyor & Discharge to Feed Elevator	2,119,920	7,500.0	0.0085	Tons Cement Produced	0.00%	2.39
6-F-14	Transfer from Feed Elevator to Weigh Feeder & then Diverter	2,119,920	7,500.0	0.0085	Tons Cement Produced	0.00%	2.39
6-F-15	Reject Bin Discharge to Conveyor & Conveyor Discharge to Elevator	2,119,920	5,000.0	0.0085	Tons Cement Produced	0.00%	1.60
6-F-16	Finish Mill #3 (Large Vertical Mill)	2,119,920	242.0	0.04	Tons Cement Produced	0.00%	42.40
6-F-17	Discharge from Cement Coolers to Cement Silo Elevator	2,119,920	7,500.0	0.0085	Tons Cement Produced	0.00%	2.39
6-F-18	Cement Silo Elevator Discharge to Cement Silos	2,119,920	7,500.0	0.0085	Tons Cement Produced	0.00%	2.39
6-F-19	Finish Mill #3 Natural Gas Furnace	300.59	0.034	7.6	MMCF Burned	99.00%	0.01
7-C-12	New Cement Silos (2)	1,461,600	10,000.0	0.0085	Tons Cement Processed	0.00%	3.19
7-C-13	Discharge from New Cement Silos to Cement Elevator and Transfer to Belt 1720	1,461,600	10,000.0	0.0085	Tons Cement Processed	0.00%	3.19
7-C-14	Transfer from Belt 1720 to Surge Bin, Barge Loading Spout 5715	2,147,345	20,000.0	0.0085	Tons Cement Processed	0.00%	6.38
8-B-13	Coke/Coal/Bottom Ash/Iron Ore Barge Unloading to Conveyor	1,039,032	5,000.0	0.0085	Tons Processed	0.00%	1.60
8-B-14	Raw Material Conveyor Transfer to Coke/Coal Pile or Covered Conveyor	1,039,032	5,000.0	0.0085	Tons Processed	0.00%	1.60
8-B-15	Covered Conveyor Discharge to Truck	632,601	5,000.0	0.0085	Tons Processed	0.00%	1.60
9-M-16	Discharge into CKD Hopper	0	2,500.0	0	Tons Product	0.00%	0.00
9-M-17	Pug Mill/Mixer	0	200.0	0	Tons Handled	0.00%	0.00
9-M-18	Conveyor Transfer from Pug Mill to Storage Building	0	200.0	0	Tons Handled	0.00%	0.00
9-M-19	Synthetic Gypsum Storage Building - Hopper Loading	0	200.0	0	Tons Product Stored	0.00%	0.00
9-M-20	Synthetic Gypsum Hopper Loadout	0	2,500.0	0	Tons Handled	0.00%	0.00
9-M-21	Synthetic Gypsum Conveyor Transfer to Belt 1703 & 1716	0	2,500.0	0	Tons Handled	0.00%	0.00
			Net Increase in PM10 Emissions:				**2078.792914**
Increase in Clinker Capacity over Avg. 2000/2003 Levels			Net Increase in PM10 Emissions:				**148.72**
Increase in Emissions from Emergency Handling of Clay/Correctives and Sand Thru Primary/Secondary Crushers							**4.10**

Table B.1
PM10 Netting Analysis Summary

	Total Net Emissions Increases for Netting Analysis:	2300.8292
	Total PM10 Emissions Increase for Project After Netting Analysis:	-698.6744

Appendix B
Table B.1
PM10 Netting Analysis Summary

DESCRIPTION	(lb/Ton)	Throughput	Source of EF	(lb/Ton)
Clay EF for Crushing	0.25	5.0	SCC 3-05-009-04	0.0125
Limestone EF for Crushing with MC% > 1.5%	0.00054	95.0	AP-42 Section 11.19.2 (8/04)	0.000513
			Average Combined PM10 EF (Lb/Ton):	**0.01301**

Limestone EF for Screening with MC% > 1.5%	0.00084	95.0	AP-42 Section 11.19.2 (1/95)	0.000798
Clay EF for Screening	0.25	5.0	SCC 3-05-009-04	0.0125
			Average Combined PM10 EF (Lb/Ton):	**0.01330**

Limestone EF for Conveyors with MC% > 1.5%	0.000048	95.0	AP-42 Section 11.19.2 (1/95)	0.0000456	
Clay EF for Conveying	0.40	5.0	SCC 3-05-009-05	0.0200	**Controlled PM10 EF**
			Average Combined PM10 EF (Lb/Ton):	**0.02005**	
			At 89.48% Control:	0.002109	**0.002635**

Emergency Processing of Clay/Sand/Correctives			PM10 Emissions (stpy)			
Material	Thruput (stpy)	EF (lb/ton)	Created Primary/Secondary Crusher	Clay Crusher	Limestone	Net
Sand	35,000	0.00054	0.01044414	0.319114286	0.01566621	-0.32434
Clay	35,000	0.25	4.83525	0.398892857	0.01566621	4.420691
						4.096355

Table B.2

Creditable PM10 Emissions Increase Due to Increase in Clinker Production Capacity Analysis

Point ID	DESCRIPTION	2003 Throughput	2000 Throughput	Avg. of 03-00 Throughput	5% increase from project 2003-05-118	Desired Production 2004-12-050	Increase for This Project tpy
1-Q-01	QUARRY DRILLING	1,820,800.00	1,957,100.00	1,888,950.00	95,962.50	4,200,000	2,215,088
1-Q-02	QUARRY BLASTING	1,820,800.00	1,957,100.00	1,888,950.00	95,962.50	4,200,000	2,215,088
1-Q-03	LOADING HAUL TRUCKS	1,820,800.00	1,957,100.00	1,888,950.00	95,962.50	4,200,000	2,215,088
1-Q-04A	SOUTH HAUL ROAD TO CRUSHER	46,408.20	49,882.18	48,145.19	2,445.87	107,049	56,458
1-Q-04C	NORTH HAUL ROAD TO CRUSHER	444.10	477.34	460.72	23.41	1,024	540
1-Q-05	LIMESTONE STORAGE PILES - LOAD IN/OUT	15,000.00	15,000.00	15,000.00	1,200.00	30,547	14,347
1-Q-05	LIMESTONE STORAGE PILES - WIND EROSION	15,000.00	15,000.00	15,000.00	0.01	15,000	0
1-Q-05	LIMESTONE STORAGE PILES - VEHICLE ACTIVITY	15,000.00	15,000.00	15,000.00	1,200.00	30,547	14,347
1-Q-06	SANDSTONE STORAGE PILE - LOAD IN/OUT	7,000.00	7,000.00	7,000.00	550.00	14,255	6,705
1-Q-06	SANDSTONE STORAGE PILE - WIND EROSION	7,000.00	7,000.00	7,000.00	0.01	7,000	0
1-Q-06	SANDSTONE STORAGE PILE - VEHICLE ACTIVITY	7,000.00	7,000.00	7,000.00	550.00	14,255	6,705
1-Q-07A	HAUL ROAD(PAVED): CLAY; ENTRANCE TO STORAGE PILE	12,334.40	10,618.40	11,476.40	449.02	23,371	11,446
1-Q-07B	HAUL ROAD(UNPAVED): CLAY; ENTRANCE TO STORAGE PILE	3,795.20	3,267.20	3,531.20	138.16	7,191	3,522
1-Q-08	CLAY STORAGE PILE - LOAD IN/OUT	118,567.00	102,140.00	110,353.50	3,285.30	224,731	111,092
1-Q-08	CLAY STORAGE PILE - WIND EROSION	118,567.00	102,140.00	110,353.50	0.01	110,354	0
1-Q-08	CLAY STORAGE PILE - VEHICLE ACTIVITY	118,567.00	102,140.00	110,353.50	3,285.30	224,731	111,092
1-Q-09	UNLOADING AT PRIMARY CRUSHER	2,061,100.00	2,063,700.00	2,062,400.00	100,672.50	4,200,000	2,036,928
1-Q-11A	HAUL ROADS(PAVED)-2ND RAW MAT'L; ENTRANCE-STORPILE	13,676.00	1,310.40	7,493.20	71.50	15,260	7,695
1-Q-11B	HAUL ROAD(UNPAVED)-2ND RAW MAT'L;ENTRANCE-STORPILE	7,364.00	705.60	4,034.80	38.50	11,151	7,078
1-Q-11C	HAUL ROAD(UNPAVED) : BOT ASH/SCALES; BARGE TO PILE	2,435.48	5,389.22	3,912.35	213.42	7,967	3,841
1-Q-11D	HAUL ROAD (UNPAVED): BOTTOM ASH; ENTRY-PILE	87.36	0.00	43.68	0.00	89	45
1-Q-11E	HAUL ROAD (PAVED) BOTTOM ASH ENTRY PILE	283.92	0.00	141.96	0.00	289	147
1-Q-11F	HAUL ROAD (PAVED) TO FLY ASH SILO	8,046.80	8,589.50	8,318.15	409.28	16,940	8,213
1-Q-12	SAND STORAGE PILE - LOAD IN/OUT	131,500.00	12,575.00	72,037.50	1,804.38	146,702	72,860
1-Q-12	SAND STORAGE PILE - WIND EROSION	131,500.00	12,575.00	72,037.50	0.01	72,038	0
1-Q-12	SAND STORAGE PILE - VEHICLE ACTIVITY	131,500.00	12,575.00	72,037.50	1,804.38	146,702	72,860
1-Q-13	BOTTOM ASH STORAGE PILE - LOAD IN/OUT	40,242.00	77,012.00	58,627.00	5,777.80	119,392	54,987
1-Q-13	BOTTOM ASH STORAGE PILE - WIND EROSION	40,242.00	77,012.00	58,627.00	0.01	58,627	0
1-Q-13	BOTTOM ASH STORAGE PILE - VEHICLE ACTIVITY	40,242.00	77,012.00	58,627.00	5,777.80	119,392	54,987
1-Q-14	MILL SCALE STORAGE PILE - LOAD IN/OUT	29,829.00	72,031.00	50,930.00	2,375.78	103,717	50,411
1-Q-14	MILL SCALE STORAGE PILE - WIND EROSION	29,829.00	72,031.00	50,930.00	0.01	50,930	0
1-Q-14	MILL SCALE STORAGE PILE - VEHICLE ACTIVITY	29,829.00	72,031.00	50,930.00	2,375.78	103,717	50,411
2-R-01	TP:PRIMARY CRUSHER SURGE BIN DISCHARGE-BELT 1701	2,061,100.00	2,063,700.00	2,062,400.00	100,672.50	4,200,000	2,036,928
2-R-02	BELTS 1701&1704 DISCHARGE IN SURG BIN;1704 TO 1705	2,473,320.00	2,476,440.00	2,474,880.00	110,991.00	4,200,000	1,614,129
2-R-03A	SURGE BIN FEEDERS	2,473,320.00	2,476,440.00	2,474,880.00	120,807.00	4,200,000	1,604,313
2-R-03C	SECONDARY CRUSHERS DISCHARGE ONTO BELTS 1702&1743	2,885,540.00	2,889,180.00	2,887,360.00	140,941.50	4,200,000	1,171,699
2-R-04	Screen 1601 and Discharge to belts 1703/1704	1,442,770.00	1,444,590.00	1,443,680.00	70,470.75	4,380,000	2,865,849
2-R-05	CRUSHED LIMESTONE STOCKPILE - LOAD IN/OUT	70,000.00	35,000.00	52,500.00	0.00	106,914	54,414
2-R-05	CRUSHED LIMESTONE STOCKPILE - WIND EROSION	70,000.00	35,000.00	52,500.00	1.26	52,500	-1
2-R-05	CRUSHED LIMESTONE STOCKPILE - VEHICLE ACTIVITY	70,000.00	35,000.00	52,500.00	0.00	106,914	54,414
2-R-07	MILL SCALE HOPPER AND DISCHARGE ONTO BELT 1703	69,400.00	103,000.00	86,200.00	4,785.00	175,543	84,558
2-R-08	SAND/BOTTOM ASH HOPPER & DISCHARGE ONTO BELT 1748	110,274.00	338,600.00	224,437.00	15,605.00	457,058	217,016
2-R-09A	SAND/BOTTOM ASH SCREENING	55,137.00	169,300.00	112,218.50	7,802.50	228,529	108,508
2-R-09B	SAND/BOTTOM ASH SCREEN DISCHARGE ONTO BELT 1747	55,137.00	169,300.00	112,218.50	7,802.50	228,529	108,508
2-R-10	BELT 1747 DISCHARGE ONTO BELT 1703	55,137.00	169,300.00	112,218.50	7,802.50	228,529	108,508
3-G-10	RAW MEAL BLENDING AND STORAGE SILOS(4)	2,141,595.00	2,219,916.00	2,180,755.50	107,884.85	4,200,000	1,911,360
3-G-11	Raw material storage silo - fly ash	80,468.00	85,895.00	83,181.50	4,375.88	169,396	81,839
5-L-03	TP:CLINKER FROM BELT 1716 TO ELEVATORS 2810/2811	151,014.00	40,239.00	95,626.50	2,613.00	1,743,240	1,645,001
5-L-05	CLINKER ELEVATORS (2810/2811)	1,327,826.00	1,377,680.00	1,352,753.00	67,001.68	1,743,240	323,485
5-L-06	CLINKER DRAG CONVEYORS-DISCHARGE IN STORAGE SILOS	1,327,826.00	1,377,680.00	1,352,753.00	67,001.68	1,743,240	323,485

Table B.2

Creditable PM10 Emissions Increase Due to Increase in Clinker Production Capacity Analysis

Point ID	DESCRIPTION	Unit of Measure	PM10 EmFactor	PM10 Control %	PTE of Increase for this Project (Tons)
1-Q-01	QUARRY DRILLING	Tons Raw Material	0.00008	0.00	0.0886
1-Q-02	QUARRY BLASTING	Tons Raw Material	0.00000	0.00	0.0000
1-Q-03	LOADING HAUL TRUCKS	Tons Handled	0.000016	0.00	0.0177
1-Q-04A	SOUTH HAUL ROAD TO CRUSHER	Vehicle-Miles	3.8189	50.00	53.9016
1-Q-04C	NORTH HAUL ROAD TO CRUSHER	Vehicle-Miles	3.8189	50.00	0.5154
1-Q-05	LIMESTONE STORAGE PILES - LOAD IN/OUT	Tons Product Stored	0.00362	0.00	0.0260
1-Q-05	LIMESTONE STORAGE PILES - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
1-Q-05	LIMESTONE STORAGE PILES - VEHICLE ACTIVITY	Tons Product Stored	0.01447	0.00	0.1038
1-Q-06	SANDSTONE STORAGE PILE - LOAD IN/OUT	Tons Product Stored	0.00134	0.00	0.0045
1-Q-06	SANDSTONE STORAGE PILE - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
1-Q-06	SANDSTONE STORAGE PILE - VEHICLE ACTIVITY	Tons Product Stored	0.01447	0.00	0.0485
1-Q-07A	HAUL ROAD(PAVED): CLAY; ENTRANCE TO STORAGE PILE	Vehicle-Miles	2.07120	95.00	0.5927
1-Q-07B	HAUL ROAD(UNPAVED): CLAY; ENTRANCE TO STORAGE PILE	Vehicle-Miles	2.07120	50.00	1.8235
1-Q-08	CLAY STORAGE PILE - LOAD IN/OUT	Tons Product Stored	0.00088	0.00	0.0489
1-Q-08	CLAY STORAGE PILE - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
1-Q-08	CLAY STORAGE PILE - VEHICLE ACTIVITY	Tons Product Stored	0.05426	0.00	3.0137
1-Q-09	UNLOADING AT PRIMARY CRUSHER	Tons of Material Unloaded	0.000016	0.00	0.0163
1-Q-11A	HAUL ROADS(PAVED)-2ND RAW MAT'L; ENTRANCE-STORPILE	Vehicle-Miles	2.07120	95.00	0.3985
1-Q-11B	HAUL ROAD(UNPAVED)-2ND RAW MAT'L;ENTRANCE-STORPILE	Vehicle-Miles	2.07120	50.00	3.6648
1-Q-11C	HAUL ROAD(UNPAVED) : BOT ASH/SCALES; BARGE TO PILE	Vehicle-Miles	3.08637	50.00	2.9639
1-Q-11D	HAUL ROAD (UNPAVED): BOTTOM ASH; ENTRY-PILE	Vehicle-Miles	2.00448	50.00	0.0227
1-Q-11E	HAUL ROAD (PAVED) BOTTOM ASH ENTRY PILE	Vehicle-Miles	2.00448	95.00	0.0074
1-Q-11F	HAUL ROAD (PAVED) TO FLY ASH SILO	Vehicle-Miles	2.02141	95.00	0.4150
1-Q-12	SAND STORAGE PILE - LOAD IN/OUT	Tons Product Stored	0.00088	0.00	0.0321
1-Q-12	SAND STORAGE PILE - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
1-Q-12	SAND STORAGE PILE - VEHICLE ACTIVITY	Tons Product Stored	0.09404	0.00	3.4260
1-Q-13	BOTTOM ASH STORAGE PILE - LOAD IN/OUT	Tons Product Stored	0.00134	0.00	0.0368
1-Q-13	BOTTOM ASH STORAGE PILE - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
1-Q-13	BOTTOM ASH STORAGE PILE - VEHICLE ACTIVITY	Tons Product Stored	0.47021	0.00	12.9278
1-Q-14	MILL SCALE STORAGE PILE - LOAD IN/OUT	Tons Product Stored	0.00157	0.00	0.0396
1-Q-14	MILL SCALE STORAGE PILE - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
1-Q-14	MILL SCALE STORAGE PILE - VEHICLE ACTIVITY	Tons Product Stored	0.00933	0.00	0.2352
2-R-01	TP:PRIMARY CRUSHER SURGE BIN DISCHARGE-BELT 1701	Tons Handled	0.002635	0.00	2.6837
2-R-02	BELTS 1701&1704 DISCHARGE IN SURG BIN;1704 TO 1705	Tons Handled	0.002635	0.00	2.1266
2-R-03A	SURGE BIN FEEDERS	Tons Handled	0.002635	0.00	2.1137
2-R-03C	SECONDARY CRUSHERS DISCHARGE ONTO BELTS 1702&1743	Tons Handled	0.002635	0.00	1.5437
2-R-04	Screen 1601 and Discharge to belts 1703/1704	Tons Processed	0.013300	89.48	2.0049
2-R-05	CRUSHED LIMESTONE STOCKPILE - LOAD IN/OUT	Tons Product Stored	0.00000	0.00	0.0000
2-R-05	CRUSHED LIMESTONE STOCKPILE - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
2-R-05	CRUSHED LIMESTONE STOCKPILE - VEHICLE ACTIVITY	Tons Product Stored	0.00000	0.00	0.0000
2-R-07	MILL SCALE HOPPER AND DISCHARGE ONTO BELT 1703	Tons Handled	0.08500	0.00	3.5937
2-R-08	SAND/BOTTOM ASH HOPPER & DISCHARGE ONTO BELT 1748	Tons Handled	0.00640	0.00	0.6945
2-R-09A	SAND/BOTTOM ASH SCREENING	Tons Processed	0.12000	0.00	6.5105
2-R-09B	SAND/BOTTOM ASH SCREEN DISCHARGE ONTO BELT 1747	Tons Handled	0.00640	0.00	0.3472
2-R-10	BELT 1747 DISCHARGE ONTO BELT 1703	Tons Handled	0.00640	0.00	0.3472
3-G-10	RAW MEAL BLENDING AND STORAGE SILOS(4)	Tons Handled	0.002635	0.00	2.5182
3-G-11	Raw material storage silo - fly ash	Tons Handled	0.00490	0.00	0.2005
5-L-03	TP:CLINKER FROM BELT 1716 TO ELEVATORS 2810/2811	Tons Cement Produced	0.00204	0.00	1.6779
5-L-05	CLINKER ELEVATORS (2810/2811)	Tons Cement Produced	0.00204	0.00	0.3300
5-L-06	CLINKER DRAG CONVEYORS-DISCHARGE IN STORAGE SILOS	Tons Cement Produced	0.00204	0.00	0.3300

Appendix B
Table B.2
Creditable PM10 Emissions Increase Due to Increase in Clinker Production Capacity Analysis

Point ID	DESCRIPTION	2003 Throughput	2000 Throughput	Avg. of 03-00 Throughput	5% increase from project 2003-05-118	Desired Production 2004-12-050	Increase for This Project tpy
5-L-07	TP:CLINKER ELEVATOR DISCHARGE TO BELT 1716	151,014.00	40,239.00	95,626.50	2,613.00	164,001	65,762
5-L-08	CLINKER STOCKPILE - LOAD IN/OUT	127,159.00	96,675.00	111,917.00	0.00	191,940	80,023
5-L-08	CLINKER STOCKPILE - WIND EROSION	127,159.00	96,675.00	111,917.00	0.03	111,917	0
5-L-08	CLINKER STOCKPILE - VEHICLE ACTIVITY	127,159.00	96,675.00	111,917.00	0.00	191,940	80,023
5-L-09	CLINKER RECLAIM FEEDERS DISCHARGE TO BELT 1715	151,014.00	40,239.00	95,626.50	2,255.00	164,001	66,120
5-L-10	Haul Road (unpaved) Clinker Barge to Pile	2,195.32	0.00	1,097.66	0.00	4,000	2,902
5-L-10A	HAUL ROAD (PAVED) CLINKER BARGE TO PILE	439.06	0.00	219.53	0.00	800	580
6-F-01	TP:CLINKER & GYPSUM FEEDERS TO BELTS 1717-8 & 1740	3,378,160.00	3,432,815.00	3,405,487.50	276,652.05	4,358,100	675,960
6-F-02	FINISH MILLS (3102/3103)	1,351,264.00	1,373,126.00	1,362,195.00	110,660.81	1,743,240	270,384
6-F-03	FINISH MILL #2 ELEVATORS (2818)	646,038.00	647,850.00	646,944.00	55,330.00	893,520	191,246
6-F-04A	FINISH MILL #1 ELEVATORS (2812)	705,226.00	725,276.00	715,251.00	55,330.00	849,720	79,139
7-C-03	BARGE LOADING SPOUTS	1,054,738.00	986,350.00	1,020,544.00	80,288.91	1,750,255	649,422
7-C-07	BARGE LOADING SURGE BIN & AIR SLIDES/LOADING BOOM	81,968.00	103,932.00	92,950.00	7,610.88	685,745	585,184
7-C-09	RAILCAR LOADING SPOUT	0.00	0.00	0.00	1,263.21	365,400	364,137
7-C-10	COMBINATION LOADING SPOUT	0.00	0.00	0.00	0.00	365,400	365,400
7-C-11	HAUL ROAD:BULK CEMENT TRUCKS,ENTRANCE TO SILOS(PAV	32,776.43	23,920.42	28,348.43	1,175.69	38,002	8,478
8-B-03A	HAUL ROAD:COKE FROM ENTRANCE TO STOCKPILE (PAVED)	0.00	0.00	0.00	0.00	0	0
8-B-03B	HAUL ROAD:COKE FROM ENTRANCE TO STOCKPILE (UNPAVE)	0.00	0.00	0.00	0.00	0	0
8-B-04	COKE STORAGE STOCKPILE - LOAD IN/OUT	214,683.00	181,522.00	198,102.50	793.13	371,593	172,697
8-B-04	COKE STORAGE STOCKPILE - WIND EROSION	214,683.00	181,522.00	198,102.50	0.05	182,470	-15,633
8-B-04	COKE STORAGE STOCKPILE - VEHICLE ACTIVITY	214,683.00	181,522.00	198,102.50	793.13	371,593	172,697
8-B-05	COKE HOPPER	217,598.00	212,821.00	215,209.50	793.13	406,431	190,428
8-B-06	TP:COKE FROM BELT 1728 TO 1730; 1730 TO 1731	217,598.00	212,821.00	215,209.50	793.13	406,431	190,428
8-B-06A	TP: COKE/COAL BELTS 1730-1731 & 1731-1722 (2TP)	606,258.00	394,136.00	500,197.00	0.00	1,018,632	518,435
9-M-01	GYPSUM UNLOADING INTO HOPPER	58,315.00	65,800.00	62,057.50	5,428.15	116,000	48,514
9-M-02	TP:GYPSUM HOPPER DISCHARGE ONTO BELT(1709)	58,315.00	65,800.00	62,057.50	4,233.40	116,000	49,709
9-M-03	GYPSUM ELEVATORS(2801/2802) & DISCHARGE TO SILO	116,630.00	131,600.00	124,115.00	10,856.30	232,000	97,029
9-M-04	GYPSUM STORAGE PILE - WIND EROSION	3,799.00	6,146.00	4,972.50	0.01	4,973	0
9-M-04	GYPSUM STORAGE PILE - VEHICLE ACTIVITY	3,799.00	6,146.00	4,972.50	1,282.13	116,000	109,745
9-M-04	GYPSUM STORAGE PILE - LOAD OUT ONLY	3,799.00	6,146.00	4,972.50	1,282.13	116,000	109,745
9-M-04H	Haul Road (unpaved) Gypsum barge to pile	30.80	122.92	76.86	25.64	132	29

Appendix B
Table B.2
Creditable PM10 Emissions Increase Due to Increase in Clinker Production Capacity Analysis

Point ID	DESCRIPTION	Unit of Measure	PM10 EmFactor	PM10 Control %	PTE of Increase for this Project (Tons)
5-L-07	TP:CLINKER ELEVATOR DISCHARGE TO BELT 1716	Tons Cement Produced	0.00204	0.00	0.0671
5-L-08	CLINKER STOCKPILE - LOAD IN/OUT	Tons Cement Produced	0.00000	0.00	0.0000
5-L-08	CLINKER STOCKPILE - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
5-L-08	CLINKER STOCKPILE - VEHICLE ACTIVITY	Tons Cement Produced	0.00000	0.00	0.0000
5-L-09	CLINKER RECLAIM FEEDERS DISCHARGE TO BELT 1715	Tons Cement Produced	0.00204	0.00	0.0674
5-L-10	Haul Road (unpaved) Clinker Barge to Pile	Vehicle-Miles	2.00448	50.00	1.4544
5-L-10A	HAUL ROAD (PAVED) CLINKER BARGE TO PILE	Vehicle-Miles	2.00448	95.00	0.0291
6-F-01	TP:CLINKER & GYPSUM FEEDERS TO BELTS 1717-8 & 1740	Tons Cement Produced	0.00204	0.00	0.6895
6-F-02	FINISH MILLS (3102/3103)	Tons Cement Produced	0.00680	0.00	0.9193
6-F-03	FINISH MILL #2 ELEVATORS (2818)	Tons Cement Produced	0.00204	0.00	0.1951
6-F-04A	FINISH MILL #1 ELEVATORS (2812)	Tons Cement Produced	0.00204	0.00	0.0807
7-C-03	BARGE LOADING SPOUTS	Tons Cement Produced	0.20000	89.48	6.8319
7-C-07	BARGE LOADING SURGE BIN & AIR SLIDES/LOADING BOOM	Tons Cement Produced	0.20000	89.48	6.1561
7-C-09	RAILCAR LOADING SPOUT	Tons Cement Produced	0.20000	89.48	3.8307
7-C-10	COMBINATION LOADING SPOUT	Tons Cement Produced	0.20000	89.48	3.8440
7-C-11	HAUL ROAD:BULK CEMENT TRUCKS,ENTRANCE TO SILOS(PAV	Vehicle-Miles	1.95260	95.00	0.4138
8-B-03A	HAUL ROAD:COKE FROM ENTRANCE TO STOCKPILE (PAVED)	Vehicle-Miles	2.00448	95.00	0.0000
8-B-03B	HAUL ROAD:COKE FROM ENTRANCE TO STOCKPILE (UNPAVE)	Vehicle-Miles	2.00448	50.00	0.0000
8-B-04	COKE STORAGE STOCKPILE - LOAD IN/OUT	Tons Processed	0.00075	0.00	0.0648
8-B-04	COKE STORAGE STOCKPILE - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
8-B-04	COKE STORAGE STOCKPILE - VEHICLE ACTIVITY	Tons Processed	0.00904	0.00	0.7808
8-B-05	COKE HOPPER	Tons Processed	0.000054	0.00	0.0051
8-B-06	TP:COKE FROM BELT 1728 TO 1730; 1730 TO 1731	Tons Processed	0.000054	0.00	0.0051
8-B-06A	TP: COKE/COAL BELTS 1730-1731 & 1731-1722 (2TP)	Tons Processed	0.000054	0.00	0.0140
9-M-01	GYPSUM UNLOADING INTO HOPPER	Tons Handled	0.15000	0.00	3.6386
9-M-02	TP:GYPSUM HOPPER DISCHARGE ONTO BELT(1709)	Tons Handled	0.15000	89.48	0.3922
9-M-03	GYPSUM ELEVATORS(2801/2802) & DISCHARGE TO SILO	Tons Handled	0.15000	3.70	7.0079
9-M-04	GYPSUM STORAGE PILE - WIND EROSION	Acres of Storage Area	0.00000	0.00	0.0000
9-M-04	GYPSUM STORAGE PILE - VEHICLE ACTIVITY	Tons Product Stored	0.01447	0.00	0.7939
9-M-04	GYPSUM STORAGE PILE - LOAD OUT ONLY	Tons Product Stored	0.00048	0.00	0.0263
9-M-04H	Haul Road (unpaved) Gypsum barge to pile	Vehicle-Miles	2.00448	50.00	0.0148
				PM10 Totals (Tons):	**148.72**

Table B.3

Haul Roads

Installation Information											
Project No.	2004-12-050										
ID No:	099-0002										
Name:	Buzzi Unicem River Plant				Silt Content Comment						
	Unpaved Haul Road Inform										
Unit ID No.:	1-Q-4A	1-Q-04C	1-Q-07A	1-Q-07B	1-Q-11A	1-Q-11B	1-Q-11C	1-Q-11D	1-Q-11E	1-Q-11F	5-L-10
Length of Haul Road (Miles):	1.1	0.2	1.3	0.4	1.3	1.20	1.0	0.4	1.3	1.3	0.5
Length of Haul Road (Feet):	5808	1056	6864	2112	6864	6336	5280	2112	6864	6864	2640
Surface Material of Road:	Rock	Rock	Paved	Rock	Paved	Rock	Rock	Rock	Paved	Paved	Rock
Silt Content % (Pit/Plant):	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
Silt Loading of Paved Road (g/m3):	NA	NA	12.0	NA	12.0	NA	NA	NA	12.0	12.0	NA
Surface Material Moisture Content (%):	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Type of Dust Control:	Water Spray	Water Spray	Pave/ Sweeping	Water Spray	Pave/ Sweeping	Water Spray	Water Spray	Water Spray	Pave/ Sweeping	Pave/ Sweeping	Water Spray
Dust Control Efficiency (%):	50.00	50.00	70.00 or 95.00	50.00	70.00 or 95.00	50.00	50.00	50.00	70.00 or 95.00	70.00 or 95.00	50.00
	Haul Truck & Hauled Material I										
Type of Material(s) Hauled:	Lime-Sand stone	Lime-Sand stone	Clay	Red Clay	Sand/Raw Mtrl	Sand/Raw Mtrl	Bot Ash/Mill	Bottom Ash	Bottom Ash	Fly Ash	Clinker
Unloaded Truck Weight (Tons):	70	70	16	16	16	16	41.5	14	14	14	14
Average Loaded Truck Weight (Tons):	152	152	41	41	41	41	96.8	39	39	40	39
Maximum Hourly Amount Hauled (Tons):	510.00	765.00	300.00	300.00	300.00	300.00	120.00	200.00	200.00	50.00	100.00
2003 Annual Amount Hauled (Tons):	1,729,760	91,040	118,600	118,600	131,500	131,500	67,341	2,730	2,730	80,468	54,883
2000 Annual Amount Hauled (Tons):	1,859,245	97,855	102,100	102,100	12,600	12,600	149,012	0.00	0.00	85,895	111,102
	Additional Information or F										
Unpaved Particle Size Multiplier for PM2.5:	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
Unpaved Particle Size Multiplier for PM10:	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
Paved Particle Size Multiplier for PM10:	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
Days of Rain with at least 0.01" per Year (Days):	110	110	110	110	110	110	110	110	110	110	110
Average Speed of Truck on Road (Miles per Hour, MPH):	10	10	15	10	15	10	10	10	15	15	10
	Equations for Unpaved Road Ca										
Mean Vehicle Weight (Tons):	= [Unloaded Truck Weight (Tons) + Average Loade										
Maximum Hourly Vehicle Miles Traveled (VMT/Hr):	= 2 x Length of Haul Road x [Maximum Hourly Amount Hauled / (Avg L										
Haul Road PM10 Emission Factor (lbs of PM10/VMT):	= (Particule Size Multiplier] x [Silt Content % / 12] ^ 0.9 x (Mean Vehicle										
	Unpaved Road Annual VMT, Max Hourly Design Rate an										
Length of Haul Road (Miles):	1.1000	0.2000	1.3000	0.4000	1.3000	1.2000	1.0000	0.4000	1.3000	1.3000	0.5000
Mean Vehicle Weight (Tons):	111.00	111.00	28.50	28.50	28.50	28.50	69.15	26.50	26.50	27.00	26.50
2003 Annual Vehicles Miles Traveled (VMT/Yr):	46,408.20	444.10	12,334.40	3,795.20	13,676.00	12,624.00	2,435.48	87.36	283.92	8,046.80	2,195.32
2000 Annual Vehicles Miles Traveled (VMT/Yr):	49,882.18	477.34	10,618.40	3,267.20	1,310.40	1,209.60	5,389.22	0.00	0.00	8,589.50	4,444.08
Maximum Hourly Vehicle Miles Traveled (VMT/Hr):	**13.6829**	**3.7317**	**31.2000**	**9.6000**	**31.2000**	**28.8000**	**4.3400**	**6.4000**	**20.8000**	**5.0000**	**4.0000**
Unpaved Road PM10 Emission Factor (lbs PM10/VMT):	**3.8189**	**3.8189**	**2.0712**	**2.0712**	**2.0712**	**2.0712**	**3.0864**	**2.0045**	**2.0045**	**2.0214**	**2.0045**

ation								
5-L-10A	7-C-11	8-B-02	8-B-03A	8-B-03B	9-M-04H	4-K-11	4-K-13	4-K-07A
0.1	1.3	0.25	1.3	0.1	0.25	1.3	1.3	0.1
528	6864	1320	6864	528	1320	6864	6864	528
Paved	Paved	Rock	Paved	Rock	Rock	Paved	Paved	Rock
8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
12.0	12.0	NA	12.0	NA	NA	12.0	12.0	NA
0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Pave/ Sweeping	Pave/ Sweeping	Water Spray	Pave/ Sweeping	Water Spray	Water Spray	Pave/ Sweeping	Pave/ Sweeping	Water Spray
70.00 or 95.00	70.00 or 95.00	50.00	70.00 or 95.00	50.00	50.00	70.00 or 95.00	70.00 or 95.00	50.00
nformation								
Clinker	Cement	Coke/Coal	Coke/Coal	Coke	Gypsum	Calcium Hydroxide	Ammonia Hydroxide	CKD
14	12.5	14	14	14	14	14	12	98
39	37.5	39	39	39	39	39	14.1	109
100.00	192.00	200.00	100.00	100.00	300.00	75.00	2.09	100.00
54,883	315,158	232,055	0	0	6,146	0	0	1,775
8,015	230,004	181,522	0	0	4,603	0	0	2,001
actors								
0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38
1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.016
110	110	110	110	110	110	110	110	110
15	15	10	15	10	10	15	15	5
lculations								
d Truck Weight (Tons)] / 2'								
oaded Truck Weight - Unloaded Truck Weight)]								
Weight / 3) ^ 0.45 x [(365 - Days of Rain) / 365]								
d PM10 Emission Factor Calculation								
0.1000	1.3000	0.2500	1.3000	0.1000	0.2500	1.3000	1.3000	0.1000
26.50	25.00	26.50	26.50	26.50	26.50	26.50	13.05	103.50
439.06	32,776.43	4,641.10	0.00	0.00	122.92	0.00	0.00	32.28
64.12	23,920.42	3,630.44	0.00	0.00	92.06	0.00	0.00	36.38
0.8000	**19.9680**	**4.0000**	**10.4000**	**0.8000**	**6.0000**	**7.8000**	**2.5876**	**1.8182**
2.0045	**1.9526**	**2.0045**	**2.0045**	**2.0045**	**2.0045**	**2.0045**	**1.4574**	**3.7005**

Appendix B
Table B.4
Stockpiles

Installation Information	
Project No.	2004-12-050
ID No:	099-0002
Name:	Buzzi Unicem River Plant
Moisture & Silt Content %: Comment	
Raw Material Load/Unload Codes Comment	

	Storage Pile Information									
Unit ID No.:	1-Q-05	1-Q-06	1-Q-08	1-Q-12	1-Q-13	1-Q-14	2-R-05	5-L-08	8-B-04	9-M-04
Type of Material Stored:	Limestone	Sandstone/Sub	Clay	Sand/Sub	Bottom Ash	Iron Ore	Limestone	Clinker	Coke	Gypsum
Maximum Hourly Amount of Material Handled:										
Maximum Surface Area of Storage Pile in Acres:	0.10	0.25	0.10	0.10	0.10	0.10	1.20	0.50	0.90	0.10
2003 Annual Amount of Material Handled in Tons:	33,000.00	15,000.00	29,272.00	59,600.00	154,100.00	23,000.00	40,000.00	49,961.00	232,055.00	26,048.00
2000 Annual Amount of Material Handled in Tons:	15,000.00	7,000.00	102,140.00	12,575.00	77,012.00	72,031.00	35,000.00	96,675	181,522	6,146.00
Moisture Content %:	2.7	5.5	7.4	7.4	5.5	4.9	2.7	0.3	8.3	7.0
Silt Content %:	1.6	1.6	6.0	2.6	13	4.3	1.6	1.6	1.0	1.6
Storage Duration in Days:	365	365	365.0	365	365	365	365	365	365.0	365
	Transfer & Control Methods for Storage Pile									
Load In Method of Material to Storage Pile:	Truck	Truck	Truck	Truck	Truck	Truck	Conveyor	Conveyor	Truck	Conveyor
Load Out Method of Material from Storage Pile:	Truck	Truck	Truck	Truck	Truck	Truck	Conveyor	Conveyor	Truck	Loader
Control Method for Load In/Out from Storage Pile:	None	None	None	None	None	None	None	None	None	None
Control Method for Wind Erosion from Storage Pile:	None	None	None	None	None	None	None	None	None	None
Control Method for Vehicle Activity of Storage Pile:	None	None	None	None	None	None	None	None	None	None
	Other Factors Affecting Emission Rates									
Mean Wind Speed In Miles per Hour (MPH):	10	10	10	10	10	10	10	10	10	10
Dry Days per Year:	255	255	255	255	255	255	255	255	255	255
Percentage (%) of Time the Wind Speed is > 12 MPH:	32	32	32	32	32	32	32	32	32	32
Vehicle Activity Factor:	0.25	0.25	0.25	1.0	1.0	0.06	0.25	0.06	0.25	0.25
Particle Size Multiplier for PM2.5:	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Particle Size Multiplier for PM10:	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35
	Equations for Storage Pile PM10/PM2.5 Emission Factor Calculations									
Load In or Load Out Factor (lbs PM10/PM2.5 per Ton Handled):	= 0.0032 x (Particle Size Multiplier) x (Mean Wind Speed / 5) ^1.3 / (Moisture Content % /2) ^1.4									
Wind Erosion Factor (lbs of PM10 per Acre-Hr):	= 0.85 x (Silt Content % /1.5) x (Dry Days per Year / 235) x (% of Time Wind>12 MPH / 15) x Storage Duration (Days)									
Activity Factor (lbs of PM10 per Ton Handled):	= 0.05 x (Silt Content % / 1.5) x (Dry Days per Year / 235) x Vehicle Activity Factor									
	Storage Pile PM10/PM2.5 Emission Factor (EF) Calculations									
Load In or Load Out PM10 EF (lbs/Ton Handled):	0.00181	0.00067	0.00044	0.00044	0.00067	0.00079	--	--	0.00038	0.00048
Wind Erosion PM10 EF (lbs/Acre-Hr):	766.07546	766.07546	2872.78298	1244.87262	6224.36312	2058.82780	766.07546	766.07546	478.79716	766.07546
Activity Factor PM10 EF (lbs/Ton Handled):	0.01447	0.01447	0.05426	0.09404	0.47021	0.00933	--	--	0.00904	0.01447
Combined Load In/Out (Lb/Ton Handled)	0.00362	0.00134	0.00088	0.00088	0.00134	0.00157	--	--	0.00075	0.00048

Table B.5
Non-PM10 Netting Analysis

Net Emission Decreases for Units Removed Under Project No. 2004-12-050		2003 Thruput	2000 Thruput	2 Year Avg. Thruput	Units of Measure	SO2 Emission Factor	SO2 Control %	SO2 Emissions (tons)	NOx Emission Factor
Point ID	**DESCRIPTION**								
4-K-02	Cement Kilns (4001/4002)	1,327,826.00	1,377,680.00	1,352,753.00	Tons Cement Produced	0.79916	0.00%	-540.53	7.725679
4-K-02A	Cement Kilns – Coke Combustion	202,086.00	197,068.00	199,577.00	Tons Burned				
4-K-02B	Cement Kilns – Waste Supplemental Fuel Combustion	0.00	0.00	0.00	Mgal Burned				
4-K-02C	Cement Kilns – Nat. Gas Combustion	72,359.00	75,972.00	74,165.50	MMCF Burned				
4-K-02D	Cement Kiln – Coal Combustion	0.00	0.00	0.00	Mgal Burned				
8-B-09A	Raw Mill Fluid Bed Furnaces – Coke Combustion	0.00	0.00	0.00	Tons Burned	14.00	50.00%	0.00	13.00
8-B-09AC	Raw Mill Fluid Bed Furnace 1 – Coal Combustion	0.00	0.00	0.00	Tons Burned	14.00	50.00%	0.00	13.00
8-B-09AK	Raw Mill Fluid Bed Furnace 1 – Coke Combustion	6,950.00	7,408.00	7,179.00	Tons Burned	14.00	50.00%	-25.13	13.00
8-B-09AN	Raw Mill Fluid Bed Furnaces – Nat. Gas Combustion	9.64	2.63	6.14	MMCF Burned	0.60	50.00%	-9.20E-04	100.00
8-B-09BC	Raw Mill Fluid Bed Furnaces – Coal Combustion	0.00	0.00	0.00	Tons Burned	14.00	50.00%	0.00	13.00
8-B-09BK	Raw Mill Fluid Bed Furnace 2 – Coke Combustion	8,562.00	8,345.00	8,453.50	Tons Burned	14.00	50.00%	-29.59	13.00
8-B-09BN	Raw Mill Fluid Bed Furnace 2 – Nat. Gas Combustion	3.86	0.66	2.26	MMCF Burned	0.60	50.00%	-3.39E-04	100.00
9-M-07-B	Gasoline Storage Tank - breathing loss	13.15	16.04	14.60	Mgal Storage Capacity				
9-M-07-W	Gasoline Storage Tank - working loss	13.15	16.04	14.60	Mgal Transferred				
9-M-08-B	Diesel Storage Tank #1- breathing loss	0.00	180.52	180.52	Mgal Storage Capacity				
9-M-08-W	Diesel Storage Tank #1 - working loss	0.00	180.52	180.52	Mgal Transferred				
9-M-09-B	Diesel Storage Tank #2 - breathing loss	0.00	180.52	180.52	Mgal Storage Capacity				
9-M-09-W	Diesel Storage Tank #2 - working loss	0.00	180.52	180.52	Mgal Transferred				
						Net Decrease in Emissions:		**-595.25**	

Net Emission Increases for Equipment Added under Project No. 2004-12-050		Potential Annual Throughput	Units of Measure	SO2 Emission Factor	SO2 Control %	SO2 Emissions (tons)	NOx Emission Factor
Point ID	**DESCRIPTION**						
4-K-09	Preheater/Precalciner Kiln – Clinker Cooler System	2,220,000.00	Tons Clinker Produced	0.48	0.00%	532.80	3.00
4-K-14	Ammonia Hydroxide Tank	8.00	Mgals				
6-F-16	Finish Mill Grinding for Finish Mills #1, #2, and #3	--	--				
6-F-19	Finish Mill #3 Furnace - Natural Gas	300.59	MMCF Burned	0.6	0.00%	0.09	100
9-M-13-B	Gasoline Storage Tank - Breathing Loss	14.59	Mgals				
9-M-13-W	Gasoline Storage Tank - Working Loss	23.94	Mgals				
9-M-14-B	Diesel Storage Tank #5- breathing loss	14.90	Mgals				
9-M-14-W	Diesel Storage Tank #5 - working loss	24.45	Mgals				
9-M-15-B	Kerosene Stroage Tank - Breathing Loss	1.96	Mgals				
9-M-15-W	Kerosene Stroage Tank - Working Loss	3.22	Mgals				
				Net Increase in Emissions:		**532.89**	

Net Emission Increases for Equipment Added under Project No. 2003-05-118			SO2 Emissions (tons)
Point ID	**DESCRIPTION**		
--	5% Increase in Clinker Capacity over Avg. 1999-2000 Levels	**Net Increase in Emissions:**	**2.78**

Net Emissions Increases from This Project Increased Utilization		2003 Thruput	2000 Thruput	2 Year Avg. Thruput	Units of Measure	5% increase from Project 2003-05-118	Desired Production 2004-12-050	Inc
Point ID	**DESCRIPTION**							
6-F-02	Finish Mills (3102/3103)	1,351,264.00	1,373,126.00	1,362,195.00	Tons Cement Produced	110,660.81	2,436,000	
9-M-05-B	Grinding Aid Storage Tank - breathing loss							
9-M-05-W	Grinding Aid Storage Tank - working loss	101.13	115.80	108.47	Mgals	9.16	186.02	
9-M-06-B	Airalon Storage Tank - breathing loss							
9-M-06-W	Airalon Storage Tank - working loss	0.00	0.00	0.00	Mgals			
9-M-10-B	Diesel Storage Tank #3 - breathing loss							
9-M-10-W	Diesel Storage Tank #3 - working loss	0.14	0.28	0.21	Mgals	0.014	0.34	
9-M-11	Degreasers	0.03	0.84	0.44	Tons Solvent Consumed	0.03	0.84	
9-M-12-B	Diesel Storage Tank #4 - breathing loss							
9-M-12-W	Diesel Storage Tank #4 - working loss	371.96	0.00	371.96	Mgals	0	610.43	
					Net Increase in Emissions:			

	SO2 Emissions (tons)
Total Emissions Increase for Project After Netting Analysis:	**-59.58**
De Minimis Levels	**40**

Table B.5

Non-PM10 Netting Analysis

NOx Control %	NOx Emissions (tons)	VOC Emission Factor	VOC Control %	VOC Emissions (tons)	CO Emission Factor	CO Control %	CO Emissions (tons)	Pb Emission Factor	Pb Control %	Pb Emissions (tons)	HAP Emission Factor	HAP Control %	HAP Emissions (tons)	Be Emission Factor	Be Control %
0.00%	-5,225.47	0.3251	0.00%	-219.89	1.339605	0.00%	-906.08	0.0031	0.00%					6.60E-07	0.00%
0.00%	0.00	0.07	0.00%	0.00	0.6	0.00%	0.00	0.0133	89.24%						
0.00%	0.00	0.07	0.00%	0.00	0.6	0.00%	0.00	0.0133	89.24%						
0.00%	-46.66	0.07	0.00%	-0.25	0.6	0.00%	-2.15	0.0133	89.24%						
0.00%	-0.31	5.5	0.00%	-0.02	84	0.00%	-0.26	0.0005	89.24%					1.20E-05	89.24%
0.00%	0.00	0.07	0.00%	0.00	0.6	0.00%	0.00	0.0133	89.24%						
0.00%	-54.95	0.07	0.00%	-0.30	0.6	0.00%	-2.54	0.0133	89.24%						
0.00%	-0.11	5.5	0.00%	-0.01	84	0.00%	-0.09	0.0005	89.24%					1.20E-05	89.24%
		16.5	0.00%	-0.12											
		5.7	0.00%	-0.04											
		0.4	0.00%	-0.04											
		0.02	0.00%	-1.81E-03											
		0.4	0.00%	-0.04											
		0.02	0.00%	-1.81E-03											
	-5,327.50			**-220.70**			**-911.12**								
NOx Control %	**NOx Emissions (tons)**	**VOC Emission Factor**	**VOC Control %**	**VOC Emissions (tons)**	**CO Emission Factor**	**CO Control %**	**CO Emissions (tons)**	**Pb Emission Factor**	**Pb Control %**	**Pb Emissions (tons)**	**HAP Emission Factor**	**HAP Control %**	**HAP Emissions (tons)**	**Be Emission Factor**	**Be Control %**
0.00%	3330.00	0.21	0.00%	233.10	2.728	0.00%	3028.08	7.50E-05	0.00%	0.08			180.77	6.60E-07	0.00%
0.00%	15.03	5.50	0.00%	0.83	84	0.00%	12.62	5.00E-04	0.00%	7.51E-05			0.14	1.20E-05	0.00%
		16.50	0.00%	0.12											
		5.70	0.00%	0.07											
		0.40	0.00%	2.98E-03											
		0.02	0.00%	2.45E-04											
		0.44	0.00%	4.31E-04											
		0.03	0.00%	4.83E-05											
	3345.03			**234.12**			**3040.70**			**0.08**					
	NOx Emissions (tons)			**VOC Emissions (tons)**			**CO Emissions (tons)**			**Pb Emissions (tons)**			**HAP Emissions (tons)**		
	5.16			**7.34**			**0.24**			**0.10**			**3.71**		
rease for This Project tpy		**VOC Emission Factor**	**VOC Control %**	**VOC Emissions (tons)**											
963,144.19		0.016	0.00%	7.71											
68.40		0.001	0.00%	0.00											
0.12		0.02	0.00%	1.16E-06											
0.38		2000	0.00%	0.38											
238.47		0.02	0.00%	0.00											
				8.08											
	NOx Emissions (tons)			**VOC Emissions (tons)**			**CO Emissions (tons)**			**Pb Emissions (tons)**			**HAP Emissions (tons)**		
	-1,977.31			**28.84**			**2,129.83**			**0.18**			**184.62**		
	40			**40**			**100**			**0.6**			**25**		

Table B.5
Non-PM10 Netting Analysis

Be Emissions (tons)	Hg Emission Factor	Hg Control %	Hg Emissions (tons)	Fluorides Emission Factor	Fluorides Control %	Fluorides Emissions (tons)
-4.46E-04	2.20E-04	0.00%		0.0009	0.00%	
-3.96E-09	2.60E-04	89.24%				
-1.46E-09	2.60E-04	89.24%				
-4.46E-04						

Be Emissions (tons)	Hg Emission Factor	Hg Control %	Hg Emissions (tons)	Fluorides Emission Factor	Fluorides Control %	Fluorides Emissions (tons)
7.33E-04	2.40E-05	0.00%	0.03	9.00E-04	0.00%	1.00
1.80E-06	2.60E-04	0.00%	3.91E-05	2.80E-06	0.00%	4.21E-07
7.34E-04			**0.03**			**1.00**

Be Emissions (tons)			Hg Emissions (tons)			Fluorides Emissions (tons)
0.00E+00			**0.00**			**0.00**

Be Emissions (tons)			Hg Emissions (tons)			Fluorides Emissions (tons)
2.88E-04			**0.03**			**1.00**
4.00E-04			**0.1**			**3**

Table B.6
HAP Emissions

HAP	CAS No.	Emission Factor (lb/ton)	Emissions (ton/yr)
4-K-09 Kiln System			
Arsenic Compounds	20-01-9	1.20E-05	0.01
Benzene	71-43-2	1.60E-02	17.76
Beryllium Compounds	20-03-1	6.60E-07	0.00
Biphenyl	95-52-4	6.10E-06	0.01
Bis (2-ethylhexyl)phthalate (ESP)	117-81-7	9.50E-05	0.11
Bromomethane	74-83-9	4.30E-05	0.05
Cadmium Compounds	20-04-2	2.20E-06	0.00
Carbon Disulfide	75-15-0	1.10E-04	0.12
Chloride	7782-50-5	2.10E-03	2.33
Chlorobenzene	108-90-7	1.60E-05	0.02
Chromium Compounds	20-06-4	1.40E-04	0.16
Dibutylphthalate	84-74-2	4.10E-05	0.05
Ethylbenzene	100-41-4	1.90E-05	0.02
Formaldehyde	50-00-0	4.60E-04	0.51
Hydrogen Chloride	7647-01-0	1.40E-01	155.40
Lead Compounds	20-11-1	7.50E-05	0.08
Manganese Compounds	20-12-2	8.60E-04	0.95
Mercury Compounds	20-13-3	2.40E-05	0.03
Methyl Ethyl Ketone	78-93-3	3.00E-05	0.03
Methylene Chloride	75-09-2	4.90E-04	0.54
Naphthalene	91-20-3	1.70E-03	1.89
Phenol	108-95-2	1.10E-04	0.12
Selenium Compounds	20-16-6	2.00E-04	0.22
Styrene	100-42-5	1.50E-06	0.00
Toluene	108-88-3	1.90E-04	0.21
Xylenes	1330-20-7	1.30E-04	0.14
			180.77
6-F-19 Finish Mill			
Arsenic Compounds	20-01-9	2.00E-04	0.00
Benzene	71-43-2	2.10E-03	0.00
Beryllium Compounds	20-03-1	1.20E-05	0.00
Cadmium Compounds	20-04-2	1.10E-03	0.00
Chromium Compounds	20-06-4	1.40E-03	0.00
Cobalt Compounds	20-07-5	8.40E-05	0.00
Dichlorobenzene	106-46-7	1.20E-03	0.00
Formaldehyde	50-00-0	3.00E-06	0.00
Hexane	110-54-3	1.80E+00	0.14
Lead Compounds	20-11-1	5.00E-04	0.00
Manganese Compounds	20-12-2	3.80E-04	0.00
Mercury Compounds	20-13-3	2.60E-04	0.00
Naphthalene	91-20-3	6.10E-04	0.00
Nickel Compounds	20-14-4	2.10E-03	0.00
Selenium Compounds	20-16-6	2.40E-05	0.00
Toluene	108-88-3	3.40E-03	0.00
			0.14
Total HAP Emissions			**180.91**